**Course:**

Masters in Computer Science (Conversion)

**Module:**

Foundations in Hardware and Software

**Assignment Title:**

Foundations in Hardware and Software –Assignment

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**Submission Date:**

20th December 2013

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## Introduction

This document is a professional user manual detailing the installation and use of hardware and software on two different operating systems: Microsoft Windows 7 and Debian 6.0.

The user manual follows a series of practical tasks set by the Institute of Public Administration (see Appendix A).

Windows 7 is an operating system produced by Microsoft for use on personal computers which was released in 2009. While Microsoft have since released Windows 8, Windows 7 remains the most in-use version of Windows at present.

Debian is an operating system composed of free software developed by an internet collaboration of volunteers aligned with The Debian Project (an association of individuals who have made it a common cause to create a free operating system). The Debian system uses the Linux kernel (a Unix-like operating system).

This user manual describes the steps taken to carry out a variety of hardware and software tasks in order to deepen the user's practical knowledge and skills.

Tasks are carried out relating to operating system installation, system updates, security, creating users, remote connectivity, performance, email accounts, system restore & registry, drivers and networking.

The manual has been written for a novice computer technician, with little to no prior knowledge of the procedures described. The step-by-step procedure is described for each task from beginning to end, with the aid of screen shots.

## Section A - Machine 1 - Windows 7 Professional Operating System

## Task A.1 - Creation of 2 Virtual Machines & Installation of Windows 7 Pro. OS

### A.1.1 - Creation of Windows Virtual Machine

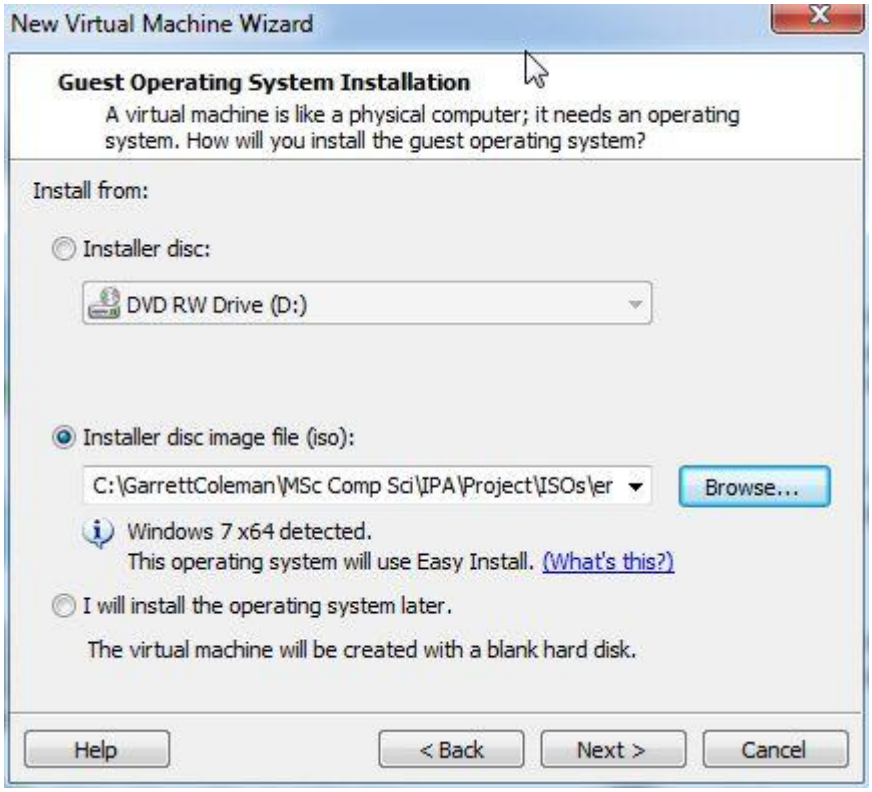
Note: The description of the second virtual machine is described in Task B.1. hereunder.

For the purposes of the tasks described in this manual, VMWare Workstation 9 has been used. The installation of this program is outside the scope of this manual.

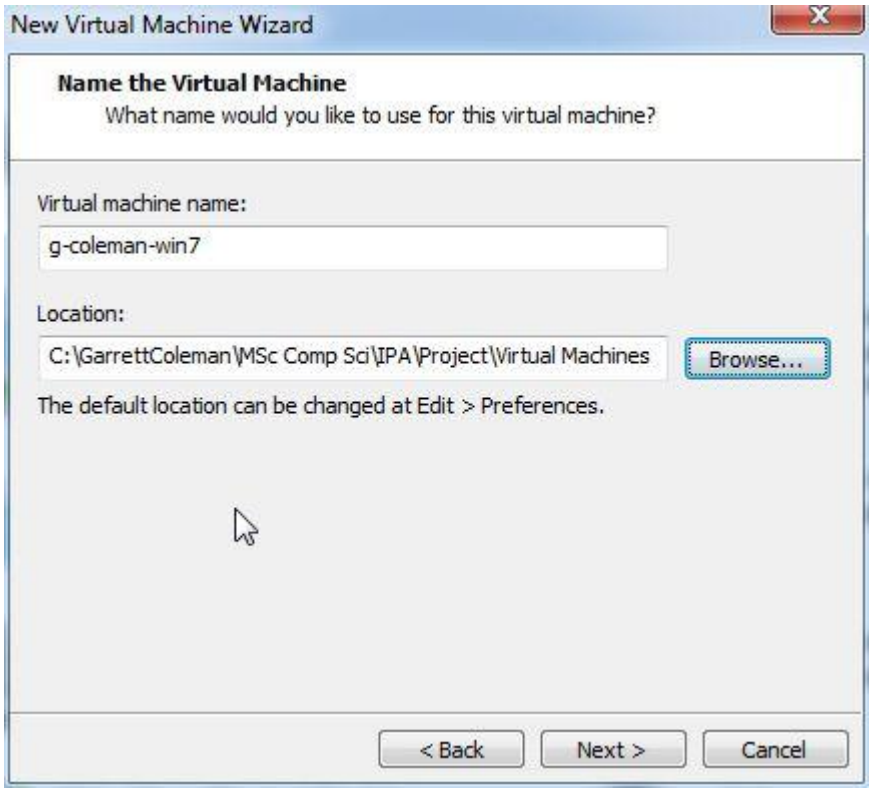
The first step is to launch the VMWare program and select "create a new virtual machine", which opens the new virtual machine wizard.

New Virtual Machine Wizard
Welcome to the New Virtual Machine Wizard
What type of configuration do you want?
Typical (recommended)
Create a Workstation 9.0 virtual machine in a few easy steps.
Custom (advanced)
Create a virtual machine with advanced options, such as a SCSI controller type, virtual disk type and compatibility with older VMware products.
VMware
Workstation 9
Help
< Back
Next >
Cancel

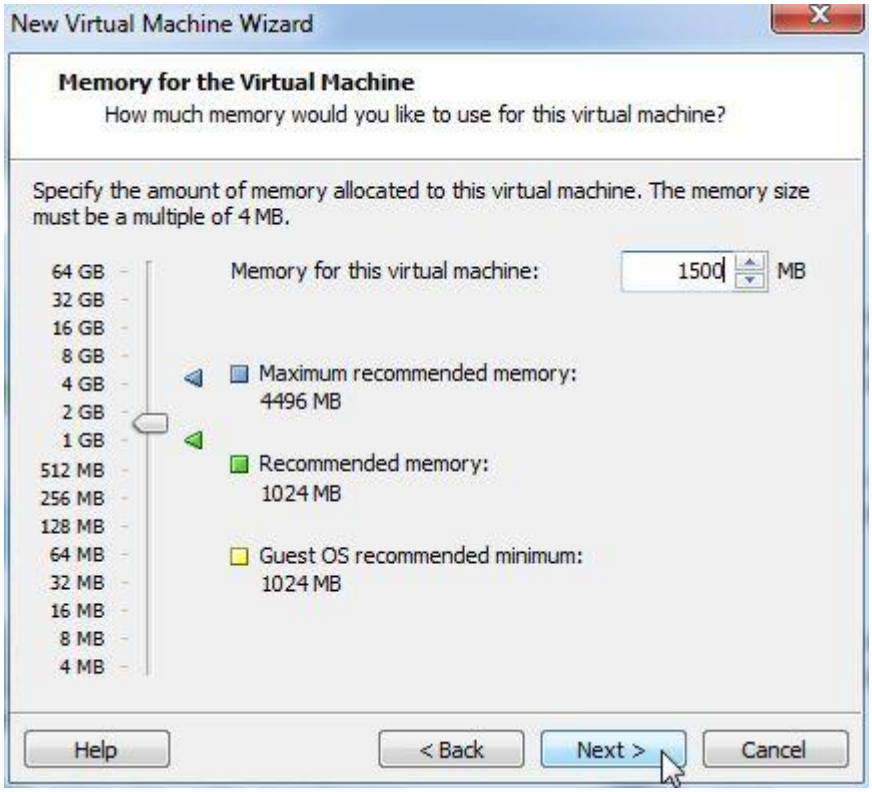
We select custom (advanced) configuration and click "next" to move to the next step.


New Virtual Machine Wizard
Guest Operating System Installation
A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?
Install from:
Installer disc:
DVD RW Drive (D:)
Installer disc image file (iso):
C:\GarrettColeman\MSc Comp Sci\IPA\Project\ISOs\er
Browse...
Windows 7 x64 detected.
This operating system will use Easy Install. (What's this?)
I will install the operating system later.
The virtual machine will be created with a blank hard disk.
Help
< Back
Next >
Cancel

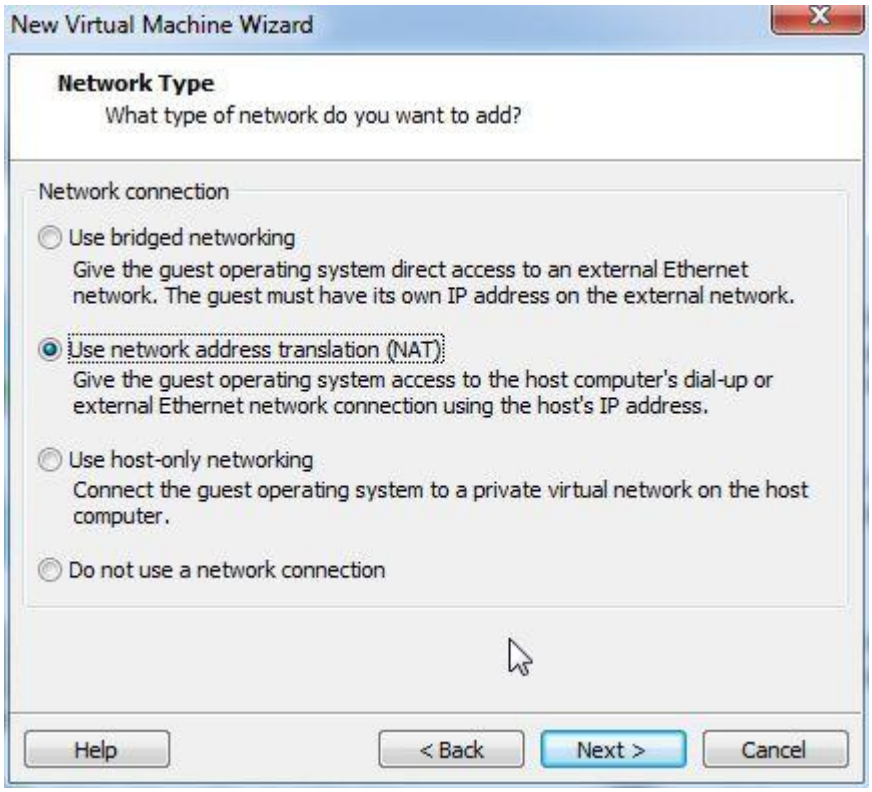
We will be using the Windows 7 Professional installer disc image file (iso) provided as part of this assignment, therefore we select that we will install the guest operating system from an ISO and browse to the location where we have saved it on the host computer's hard drive, and click "next" to move to the next step.


New Virtual Machine Wizard
Name the Virtual Machine
What name would you like to use for this virtual machine?
Virtual machine name:
g-coleman-win7
Location:
C:\GarrettColeman\MSc Comp Sci\IPA\Project\Virtual Machines
Browse...
The default location can be changed at Edit > Preferences.
< Back
Next >
Cancel

We name the virtual machine as g-coleman-win7, and browse to the folder where we wish the virtual machine to be saved to, and select "next" to move to the next step.



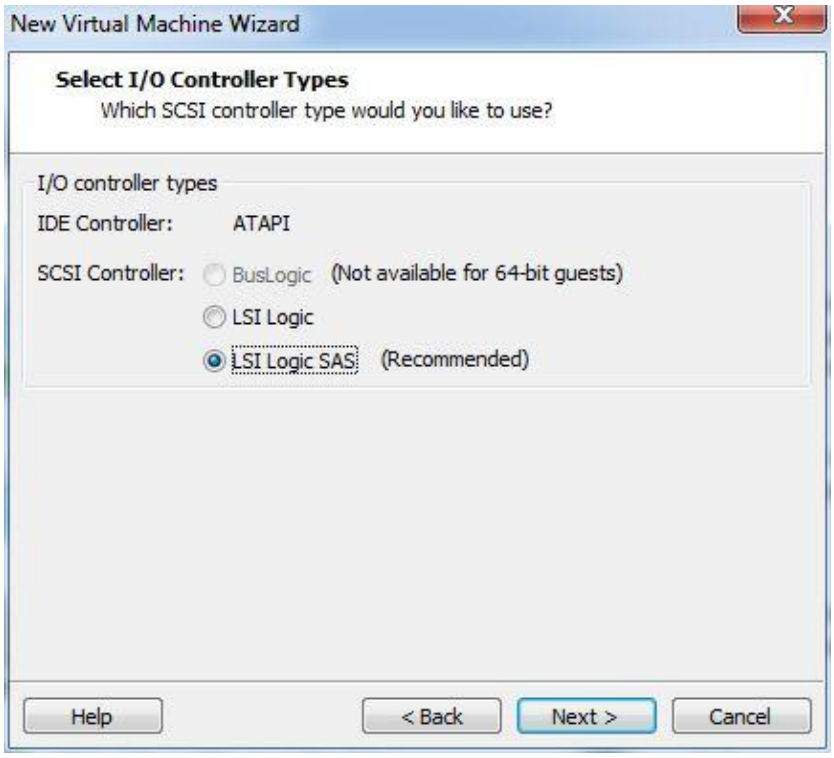

We specify 1500MB of memory to be allocated to the virtual machine, and click "next" to move to the next step.


New Virtual Machine Wizard
Network Type
What type of network do you want to add?
Network connection
Use bridged networking
Give the guest operating system direct access to an external Ethernet network. The guest must have its own IP address on the external network.
Use network address translation (NAT)
Give the guest operating system access to the host computer's dial-up or external Ethernet network connection using the host's IP address.
Use host-only networking
Connect the guest operating system to a private virtual network on the host computer.
Do not use a network connection
Help
< Back
Next >
Cancel

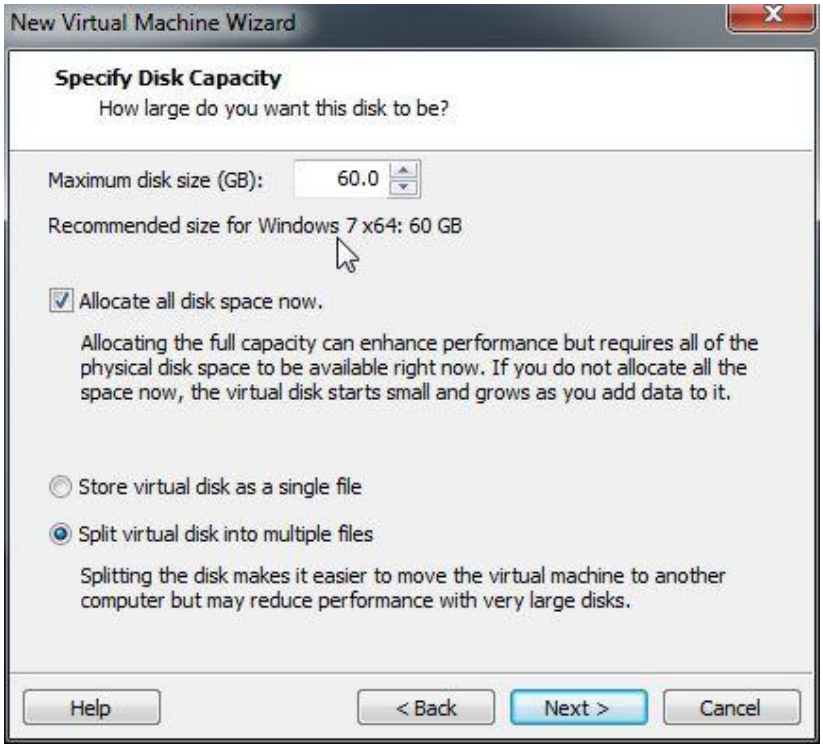
We next select network address translation (NAT) as the type of network we will use for the virtual machine.

Bridged networking connects a virtual machine to a network by using the network adapter on the host system, while with NAT networking, a virtual machine does not have its own IP address on the external network. Instead, a separate private network is set up on the host system.

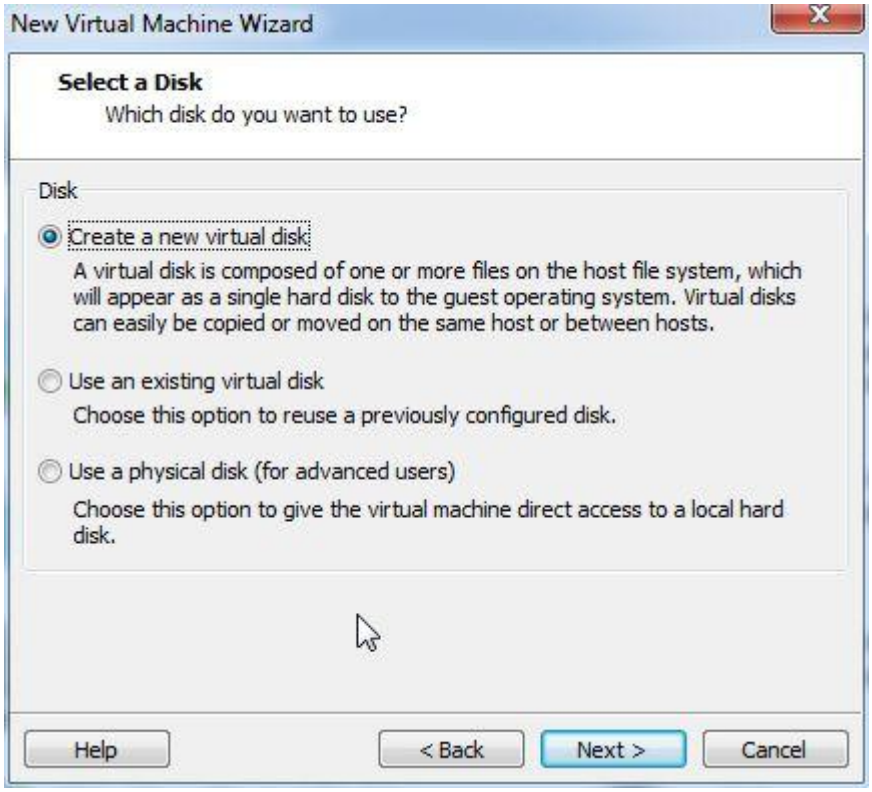
The virtual machine and the host system share a single network identity that is not visible on the external network. With bridged networking the VM requires it's own IP address from the network it is supposed to belong to, while NAT networking is often used when the amount of IP addresses in the external network is limited. As this assignment was largely being carried out at University College Dublin, where the author has experience poor wireless internet accessibility, the virtual machine was initially set up using NAT networking.



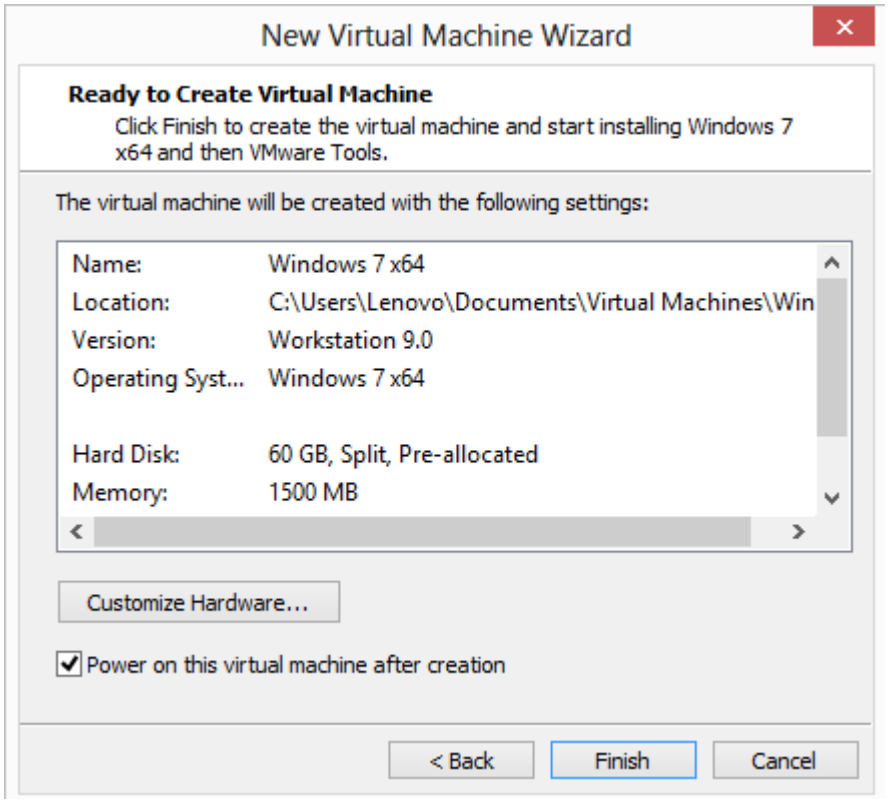

The standard recommended LSI logic SAS SCSI controller is selected, and we then click "next" to move to the next step.


New Virtual Machine Wizard
Specify Disk Capacity
How large do you want this disk to be?
Maximum disk size (GB): 60.0
Recommended size for Windows 7 x64: 60 GB
Allocate all disk space now.
Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.
Store virtual disk as a single file
Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Help
< Back
Next >
Cancel

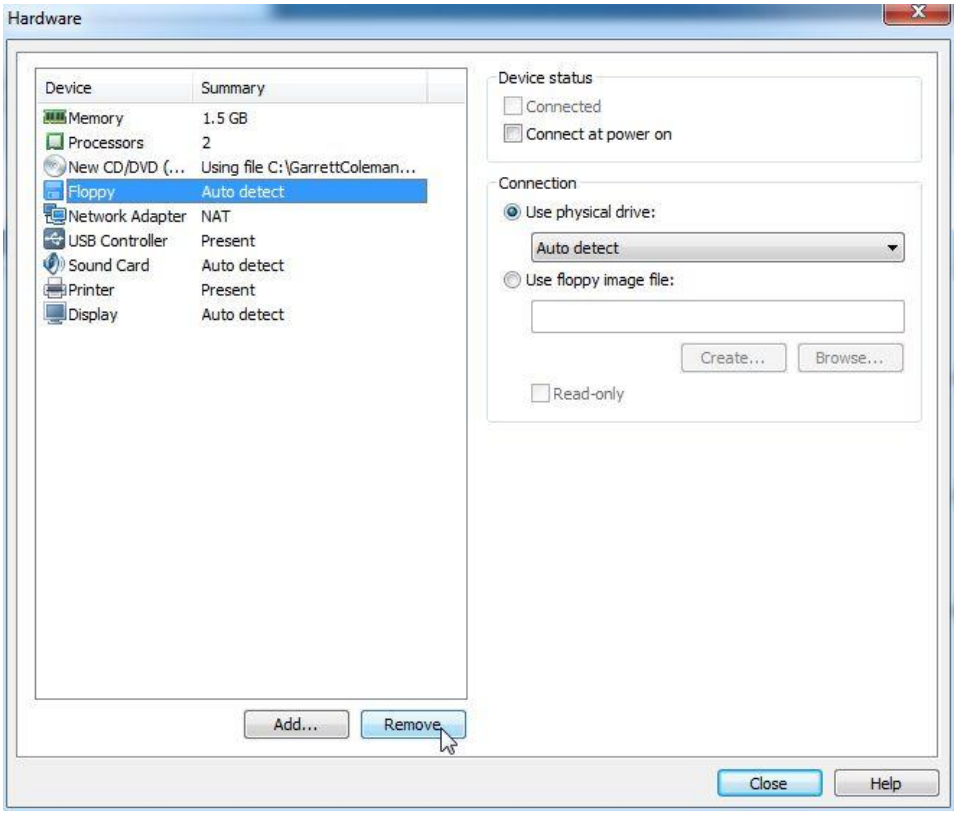
We specify the maximum disk size as 60GB as per the assignment instructions, tick to allocate all disk space now, and select to split the virtual disk into multiple files.


New Virtual Machine Wizard
Select a Disk
Which disk do you want to use?
Disk
Create a new virtual disk
A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.
Use an existing virtual disk
Choose this option to reuse a previously configured disk.
Use a physical disk (for advanced users)
Choose this option to give the virtual machine direct access to a local hard disk.
Help
< Back
Next >
Cancel

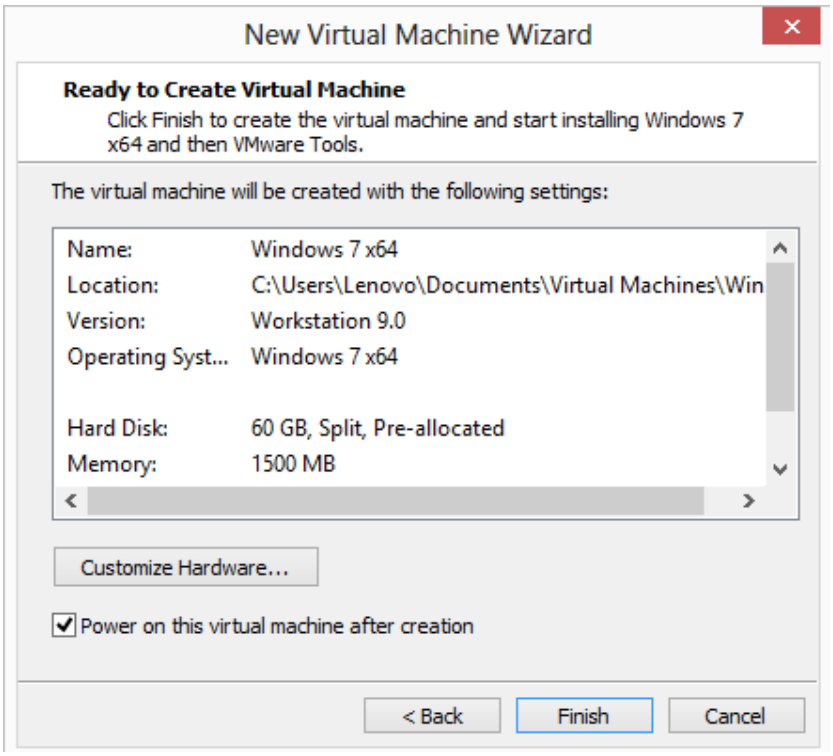
We select "create a new virtual disk" and click next to move to the next step.


New Virtual Machine Wizard
Ready to Create Virtual Machine
Click Finish to create the virtual machine and start installing Windows 7 x64 and then VMware Tools.
The virtual machine will be created with the following settings:
Name: Windows 7 x64
Location: C:\Users\Lenovo\Documents\Virtual Machines\Win
Version: Workstation 9.0
Operating Syst... Windows 7 x64
Hard Disk: 60 GB, Split, Pre-allocated
Memory: 1500 MB
Customize Hardware...
Power on this virtual machine after creation
< Back
Finish
Cancel

Before we click finish to finish the wizard setup we click on "customise hardware".

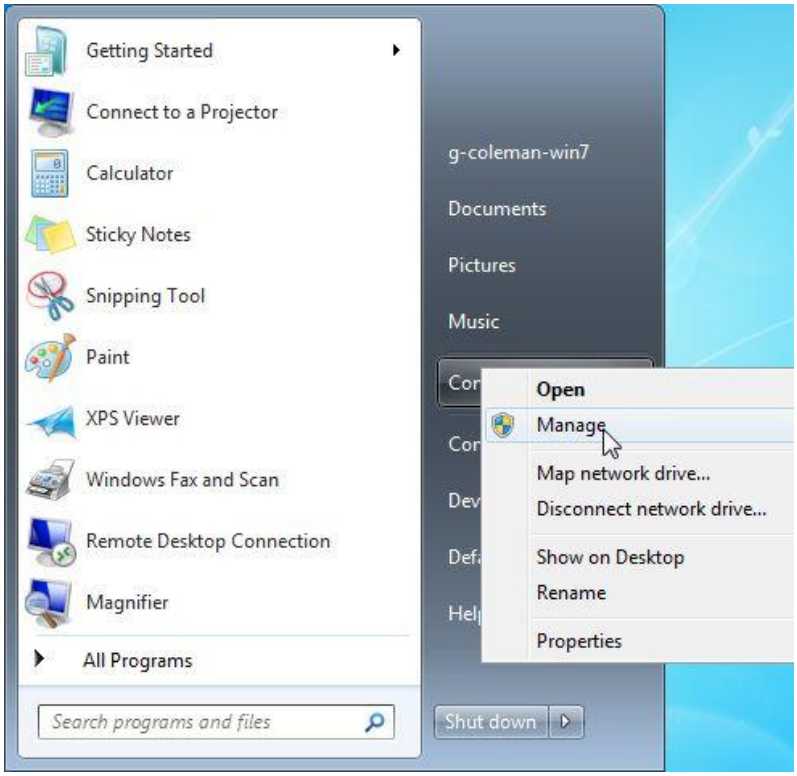



This opens a summary of the specification for the virtual machine that we are creating. We highlight the floppy device and click on "remove" to minimise unnecessary resource usage.

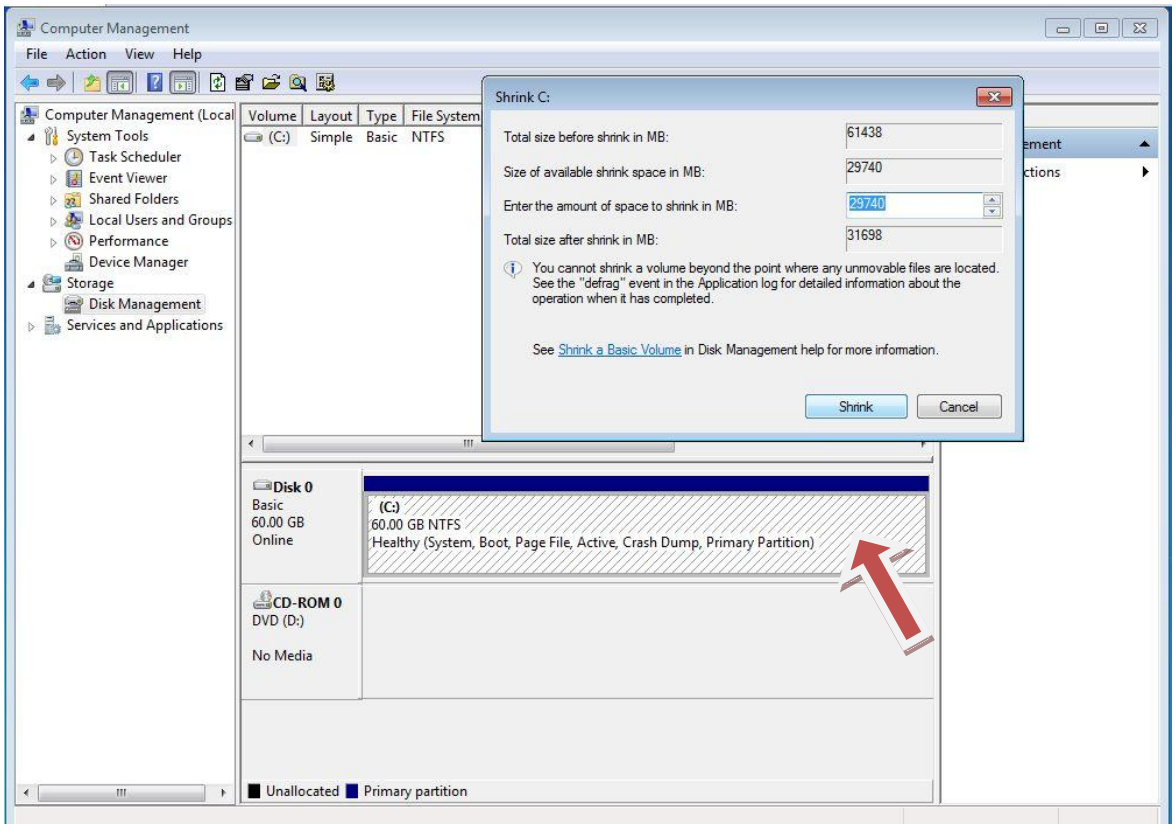

New Virtual Machine Wizard
Ready to Create Virtual Machine
Click Finish to create the virtual machine and start installing Windows 7 x64 and then VMware Tools.
The virtual machine will be created with the following settings:
Name: Windows 7 x64
Location: C:\Users\Lenovo\Documents\Virtual Machines\Win
Version: Workstation 9.0
Operating Syst... Windows 7 x64
Hard Disk: 60 GB, Split, Pre-allocated
Memory: 1500 MB
Customize Hardware...
Power on this virtual machine after creation
< Back
Finish
Cancel

We tick the option to power on the virtual machine after creation, and then click "finish". The virtual machine is now created and powers on, installing the Windows 7 operating system in the process. During the installation we select English as the language to install, we set the time and currency format as English (Ireland), and the keyboard or input method as Irish, and tick to accept the Microsoft license terms.

### A.1.2 - Setting up System Partitions

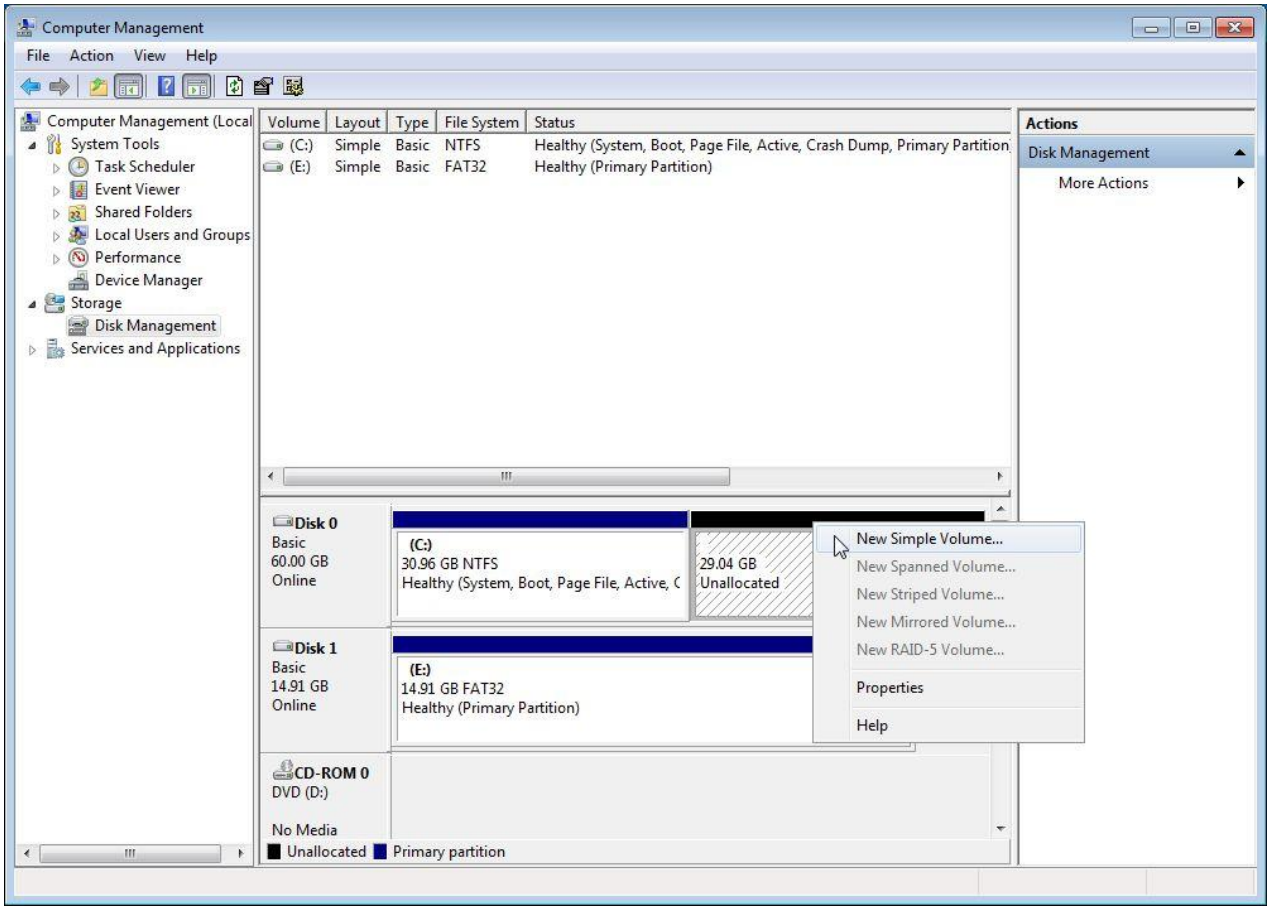



Once the operating system has finished installing we open the start menu by clicking on the microsoft symbol on the bottom left of the screen, and then right click on computer, and click "manage".

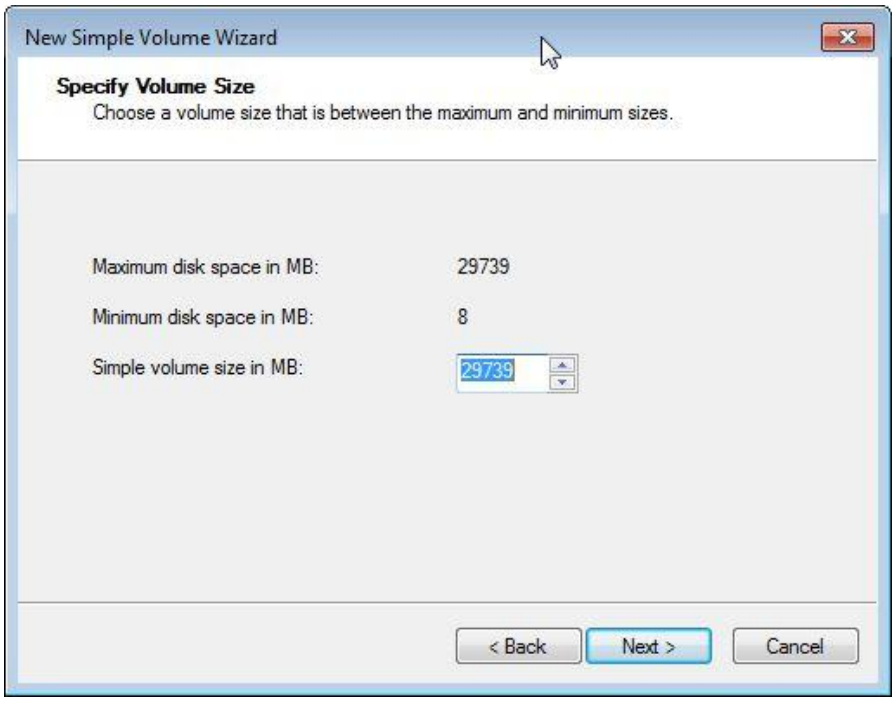

Computer Management
File Action View Help
Computer Management (Local
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Disk Management
Services and Applications
Volume Layout Type File System
(C:) Simple Basic NTFS
Shrink C:
Total size before shrink in MB: 61438
Size of available shrink space in MB: 29740
Enter the amount of space to shrink in MB: 29740
Total size after shrink in MB: 31698
You cannot shrink a volume beyond the point where any unmovable files are located. See the "defrag" event in the Application log for detailed information about the operation when it has completed.
See Shrink a Basic Volume in Disk Management help for more information.
Shrink
Cancel
Disk 0
Basic
60.00 GB
Online
(C:)
60.00 GB NTFS
Healthy (System, Boot, Page File, Active, Crash Dump, Primary Partition)
CD-ROM 0
DVD (D:)
No Media
Unallocated
Primary partition

This opens the computer management utility, where we click on the disk management sub-file of storage. This opens the currently provided single partition on the system, on which the operating system is installed. We right-click within the hatched are of the C drive and click on

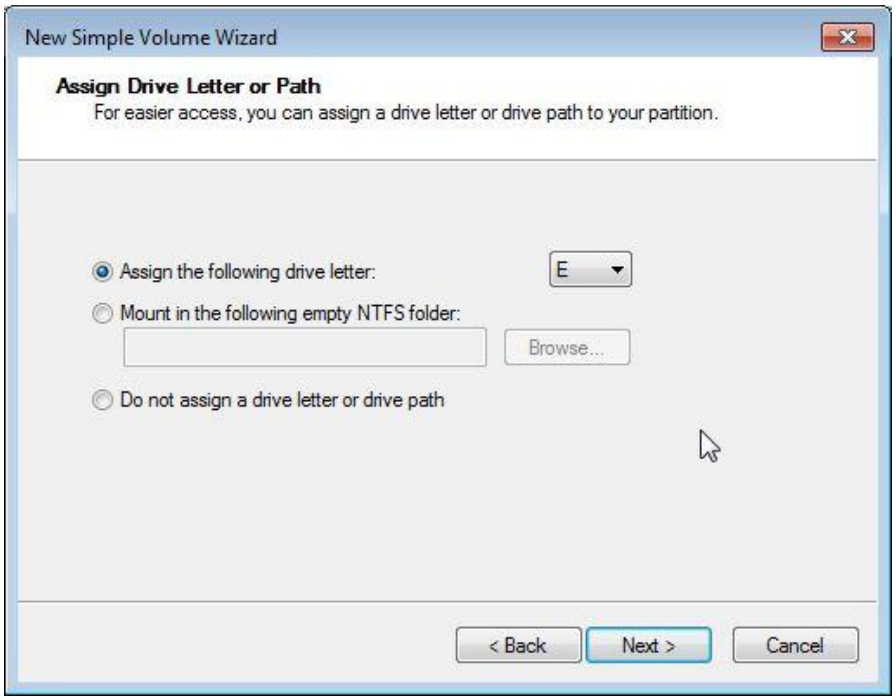
"shrink". This opens a window where we can select the amount we wish to shrink the main partition by, we select 30000 MB and then click on "shrink".



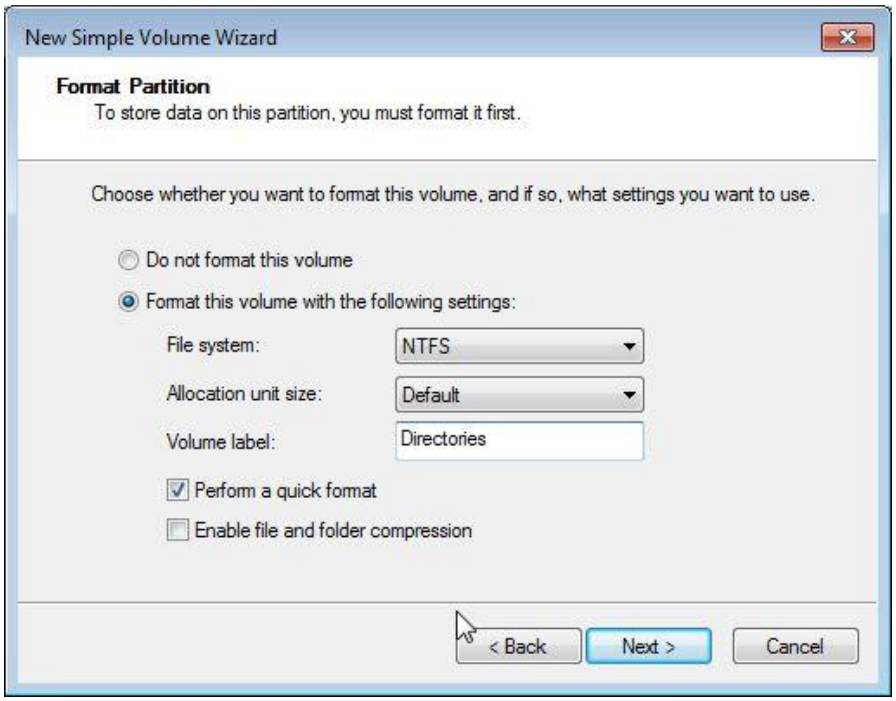

This then leaves 30 GB as "unallocated". We right click on the unallocated disk space and click on "new simple volume", to create a second partition which we will create as the location for secured directories for system users.


New Simple Volume Wizard
Specify Volume Size
Choose a volume size that is between the maximum and minimum sizes.
Maximum disk space in MB: 29739
Minimum disk space in MB: 8
Simple volume size in MB: 29739
< Back
Next >
Cancel

This opens the new simple volume wizard, where we set the simple volume size as the maximum disk size available, and cick "next" to move to the next step.


New Simple Volume Wizard
Assign Drive Letter or Path
For easier access, you can assign a drive letter or drive path to your partition.
Assign the following drive letter:
E
Mount in the following empty NTFS folder:
Browse...
Do not assign a drive letter or drive path
< Back
Next >
Cancel

We assign the letter E to the new partition being created.


New Simple Volume Wizard
Format Partition
To store data on this partition, you must format it first.
Choose whether you want to format this volume, and if so, what settings you want to use.
Do not format this volume
Format this volume with the following settings:
File system:
NTFS
Allocation unit size:
Default
Volume label:
Directories
Perform a quick format
Enable file and folder compression
< Back
Next >
Cancel

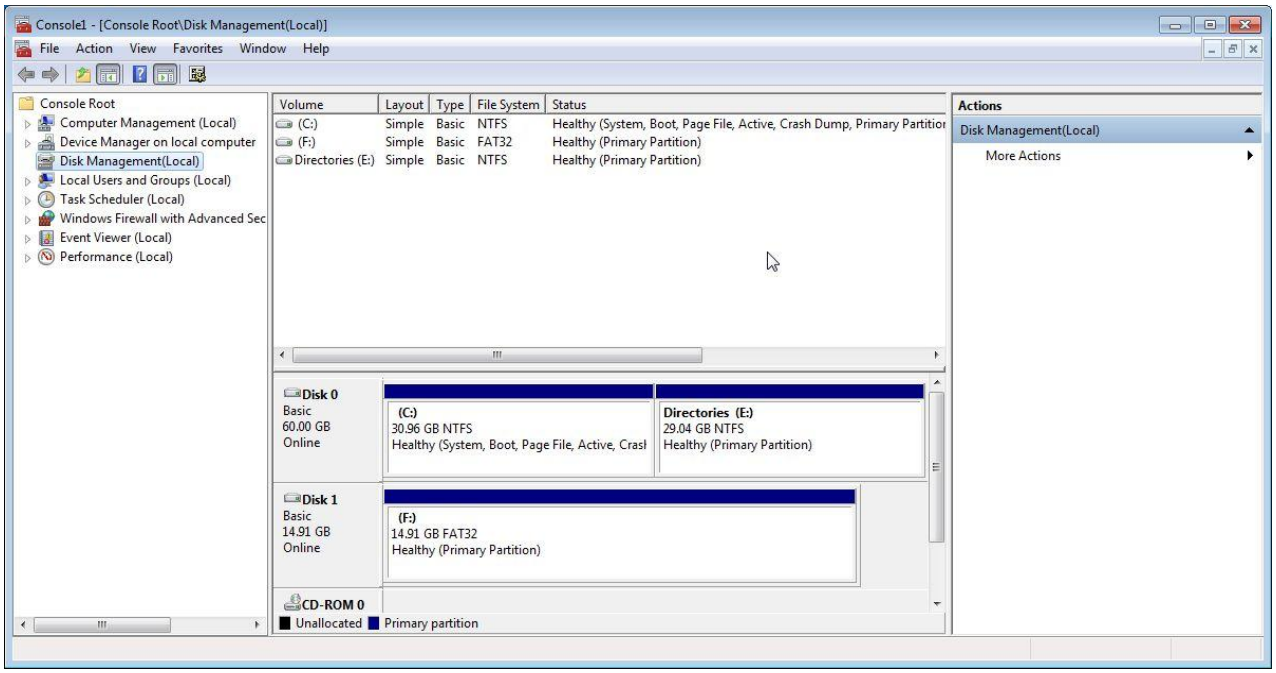
We then select to format the new drive using the NTFS file system and tick to perform a quick format, and then click "next" to move to the next step, where we click "finish" to complete the wizard.

For the file system we have the choice of NTFS and FAT32.
FAT32 is the older of the two drive formats. FAT32 is the most common version of the old FAT (File Allocation Table) file and has been the standard format for floppy disks and hard drives through the various versions of Windows.

NTFS (New Technology Files System) is the newer drive format. Windows 7 and 8 default to NTFS format on new PCs.

The table below shows the comparison between the two file systems, and the associated benefits and drawbacks of each *(source: www.guidingtech.com, 2013)*

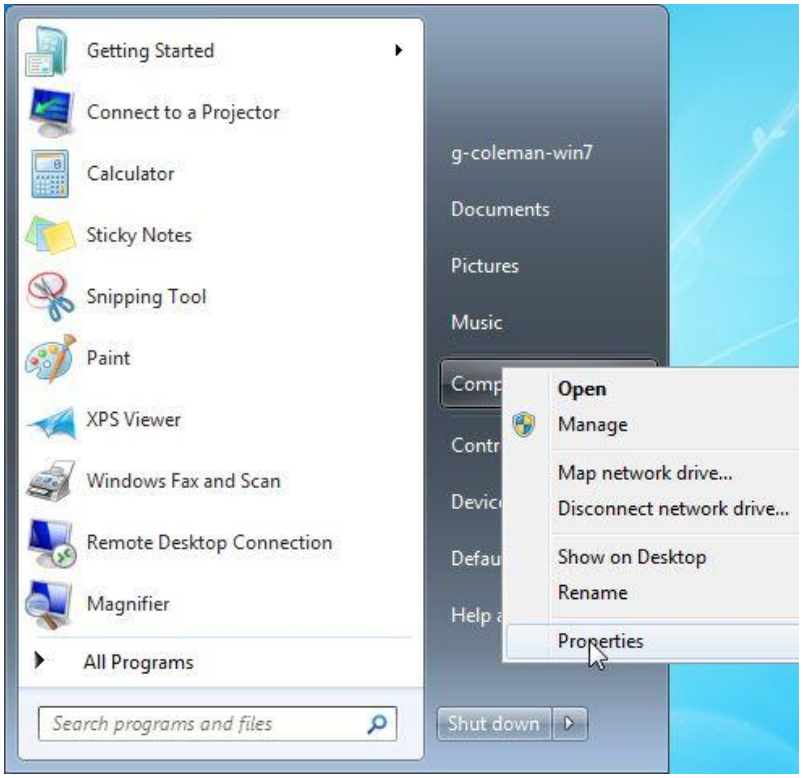
| FEATURE | FAT32 | NTFS |
|---|---|---|
| Max. Partition Size | 2TB | 2TB |
| Max. File Name | 8.3 Characters | 255 Characters |
| Max. File Size | 4GB | 16TB |
| File/Folder Encryption | No | Yes |
| Fault Tolerance | No | Auto Repair |
| Security | Only Network | Local and Network |
| Compression | No | Yes |
| Conversion | Possible | Not Allowed |
| Compatibility | Win 95/98/2K/2K3/XP | Win NT/2K/XP/Vista/7 |



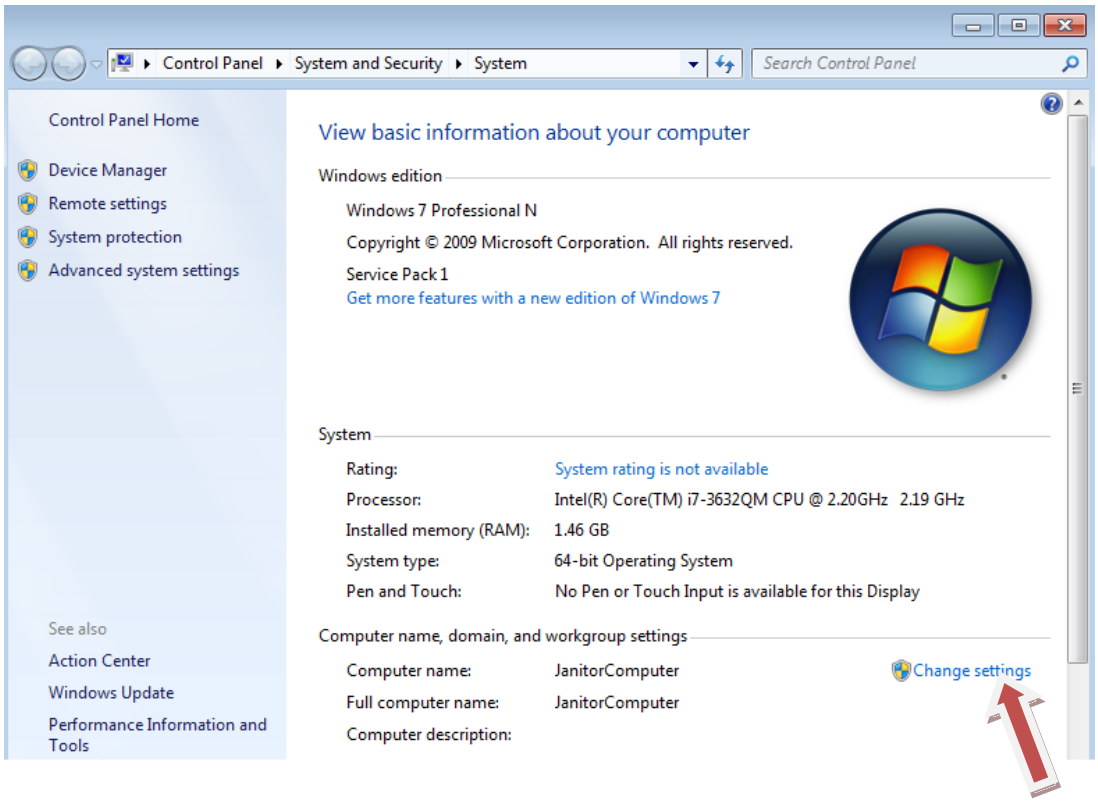

Back at the disk management utility, we can now see that the system has two partitions each of 30 GB in size.

### A.1.3 - Assigning the Machine to a Workgroup

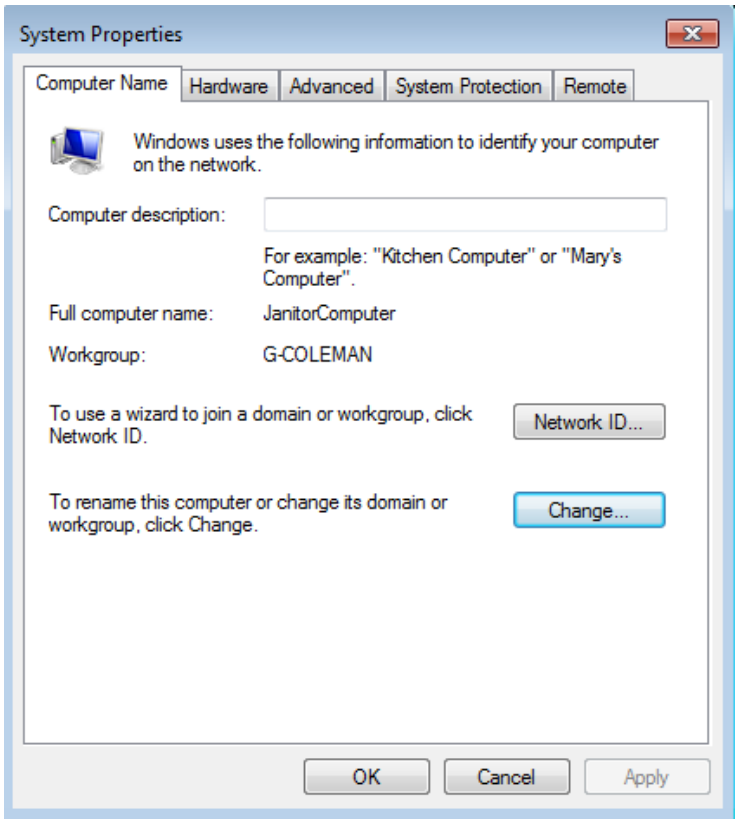
We will now assign the machine we have just created to workgroup g-colemean.




We once again access the start menu and right click on computer, this time clicking on "properties".


Control Panel ▸ System and Security ▸ System
Search Control Panel
Control Panel Home
Device Manager
Remote settings
System protection
Advanced system settings
View basic information about your computer
Windows edition
Windows 7 Professional N
Copyright © 2009 Microsoft Corporation. All rights reserved.
Service Pack 1
Get more features with a new edition of Windows 7
System
Rating: System rating is not available
Processor: Intel(R) Core(TM) i7-3632QM CPU @ 2.20GHz 2.19 GHz
Installed memory (RAM): 1.46 GB
System type: 64-bit Operating System
Pen and Touch: No Pen or Touch Input is available for this Display
Computer name, domain, and workgroup settings
Computer name: JanitorComputer
Full computer name: JanitorComputer
Computer description:
Change settings
See also
Action Center
Windows Update
Performance Information and Tools

This opens the system window where, under computer name, domain, and workgroup settings, we click on "change settings".

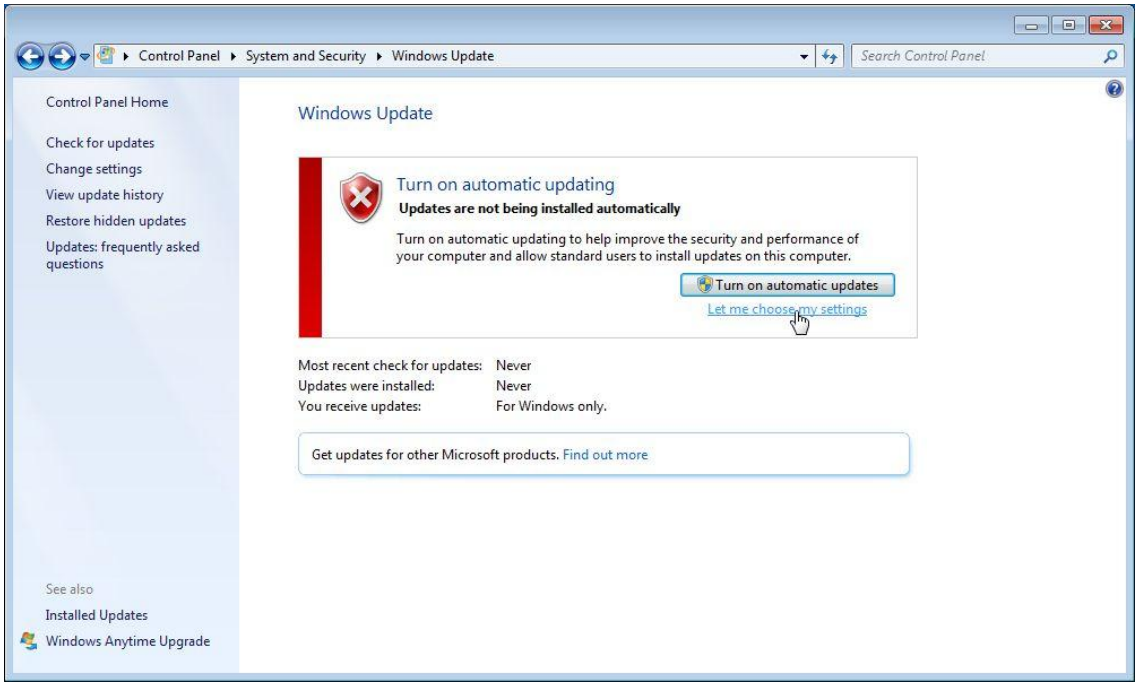



This opens the system properties window where we click "change" to rename the computer or change its domain name or workgroup.

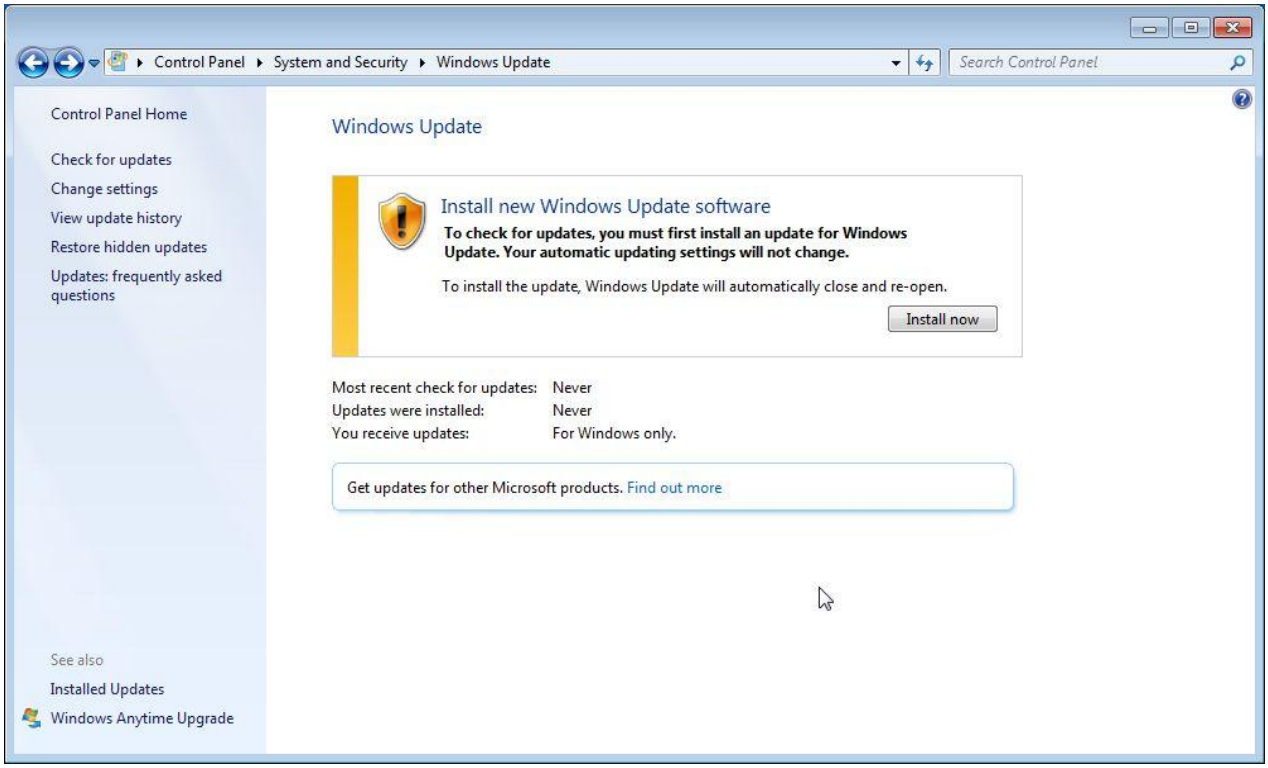
This opens the computer name/domain changes window, where we assign the computer the name of JanitorComputer (for security purposes, such a name would be less likely to be targeted by hackers), and click on workgroup for the computer to be a member of a workgroup, which we name g-coleman.

## Task A.2 - Updates and Antivirus

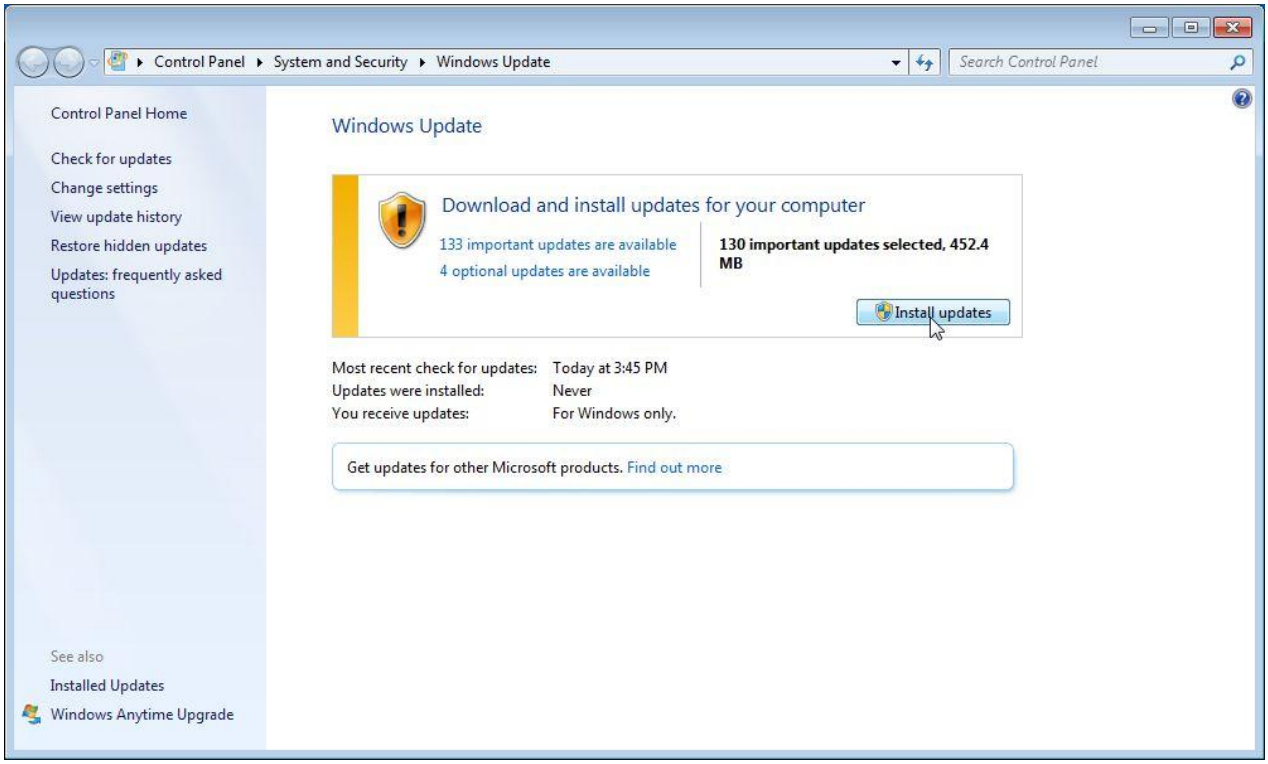
### A.2.1 - Updates


Control Panel ▸ System and Security ▸ Windows Update
Search Control Panel
Control Panel Home
Check for updates
Change settings
View update history
Restore hidden updates
Updates: frequently asked questions
Windows Update
Turn on automatic updating
Updates are not being installed automatically
Turn on automatic updating to help improve the security and performance of your computer and allow standard users to install updates on this computer.
Turn on automatic updates
Let me choose my settings
Most recent check for updates: Never
Updates were installed: Never
You receive updates: For Windows only.
Get updates for other Microsoft products. Find out more
See also
Installed Updates
Windows Anytime Upgrade

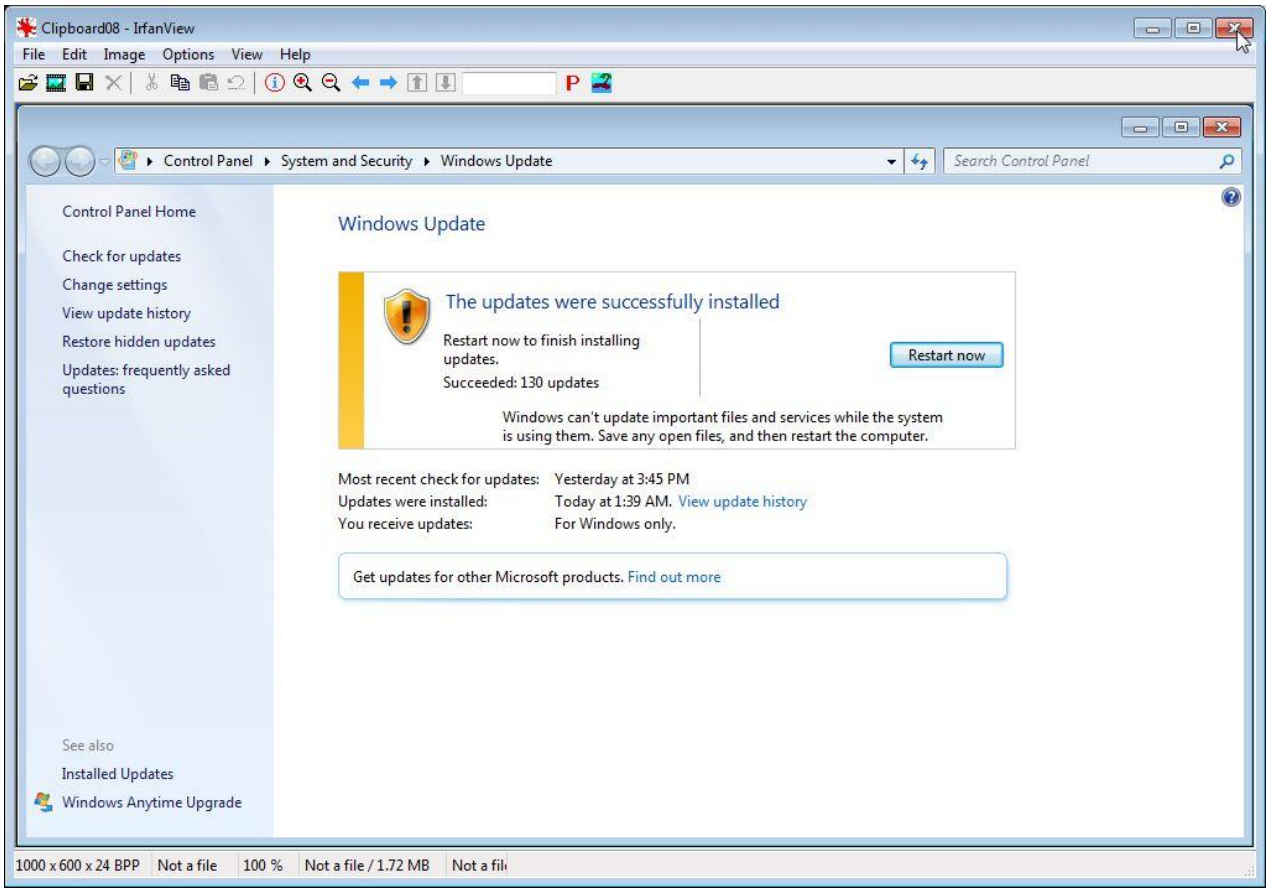
From the start menu we click on "control panel" and select "system and security", where we click on "windows updates". From the windows updates dialog we select "turn on automatic updates".


Control Panel ▸ System and Security ▸ Windows Update
Search Control Panel
Control Panel Home
Check for updates
Change settings
View update history
Restore hidden updates
Updates: frequently asked questions
Windows Update
Install new Windows Update software
To check for updates, you must first install an update for Windows Update. Your automatic updating settings will not change.
To install the update, Windows Update will automatically close and re-open.
Install now
Most recent check for updates: Never
Updates were installed: Never
You receive updates: For Windows only.
Get updates for other Microsoft products. Find out more
See also
Installed Updates
Windows Anytime Upgrade

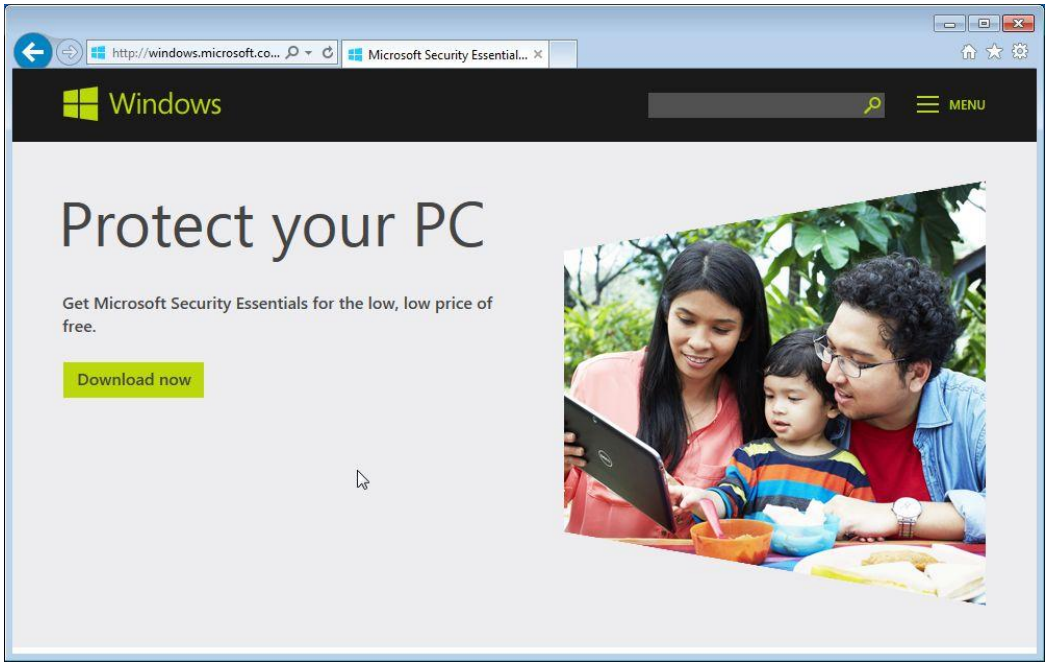
We then are presented with the install new windows updates software window where we click "install now", to check for updates.


Control Panel ▸ System and Security ▸ Windows Update
Search Control Panel
Control Panel Home
Check for updates
Change settings
View update history
Restore hidden updates
Updates: frequently asked questions
Windows Update
Download and install updates for your computer
133 important updates are available
4 optional updates are available
130 important updates selected, 452.4 MB
Install updates
Most recent check for updates: Today at 3:45 PM
Updates were installed: Never
You receive updates: For Windows only.
Get updates for other Microsoft products. Find out more
See also
Installed Updates
Windows Anytime Upgrade

We then click install updates, and the downloading, configuration and installation process begins. It is worth noting that this is a lengthy process, and is best left to run overnight in order to best make use of time.


Clipboard08 - IrfanView
File Edit Image Options View Help
Control Panel ▸ System and Security ▸ Windows Update
Search Control Panel
Control Panel Home
Check for updates
Change settings
View update history
Restore hidden updates
Updates: frequently asked questions
Windows Update
The updates were successfully installed
Restart now to finish installing updates.
Succeeded: 130 updates
Restart now
Windows can't update important files and services while the system is using them. Save any open files, and then restart the computer.
Most recent check for updates: Yesterday at 3:45 PM
Updates were installed: Today at 1:39 AM. View update history
You receive updates: For Windows only.
Get updates for other Microsoft products. Find out more
See also
Installed Updates
Windows Anytime Upgrade
1000 x 600 x 24 BPP
Not a file
100 %
Not a file / 1.72 MB

### A.2.2 Antivirus




Using the internet browser we navigate to: http://windows.microsoft.com/en-IE/windows/security-essentials-download, where we click on "download now" to download the microsoft security essentials antivirus software, "for the low low price of free".

Microsoft Security Essentials
Welcome to the Microsoft Security Essentials Installation Wizard
Microsoft Security Essentials
Security Essentials helps enhance the security and performance of your computer.
Security Essentials is continuously updated with new features and services that may require sending additional information to Microsoft. To learn more, read the Privacy Statement. The latest updates will download after the installation completes.
Click Next to continue.
Next >
Cancel

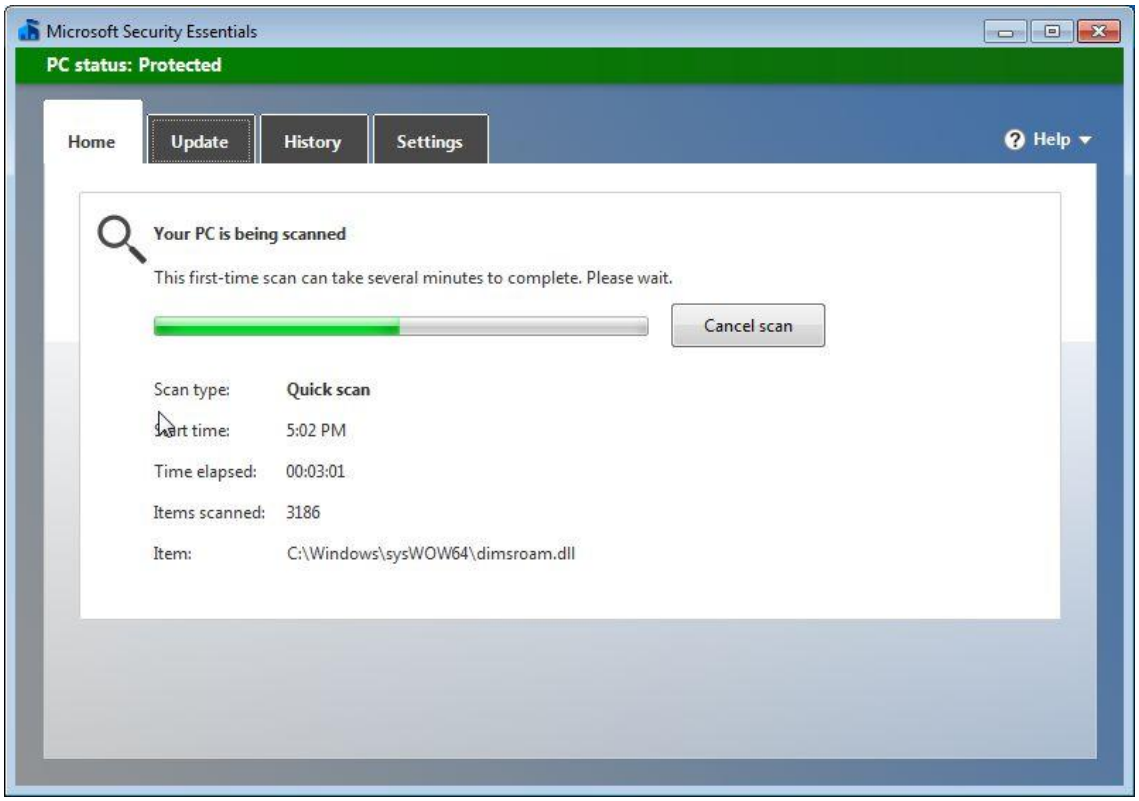
Once it has downloaded we select "run" which starts the installation wizard.

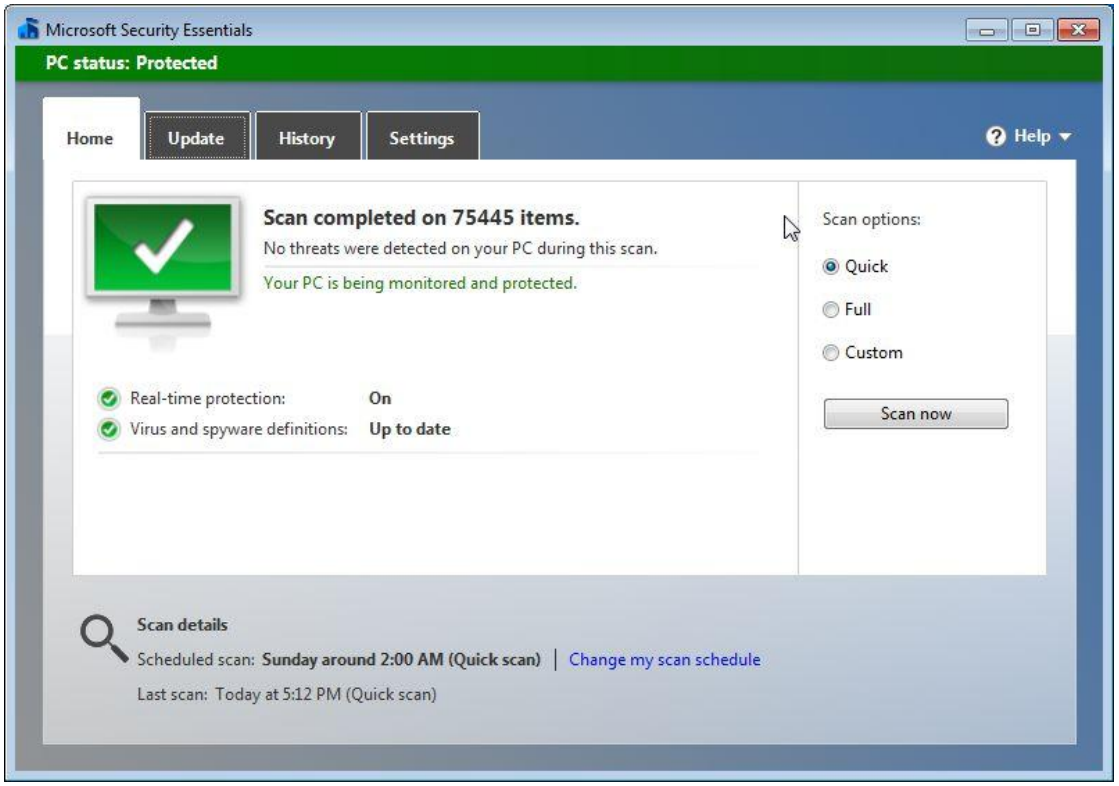
Microsoft Security Essentials
Ready to install Microsoft Security Essentials
If you have other antivirus or antispyware programs installed on your computer, they may conflict with Security Essentials and prevent it from working properly. Having multiple antivirus or antispyware programs may also cause severe performance issues on your computer.
We recommend that you remove other antivirus and antispyware programs before continuing with this wizard.
How do I uninstall other antivirus and antispyware?
Install >
Cancel

We click "next" through the wizard and click "install" to install the software.

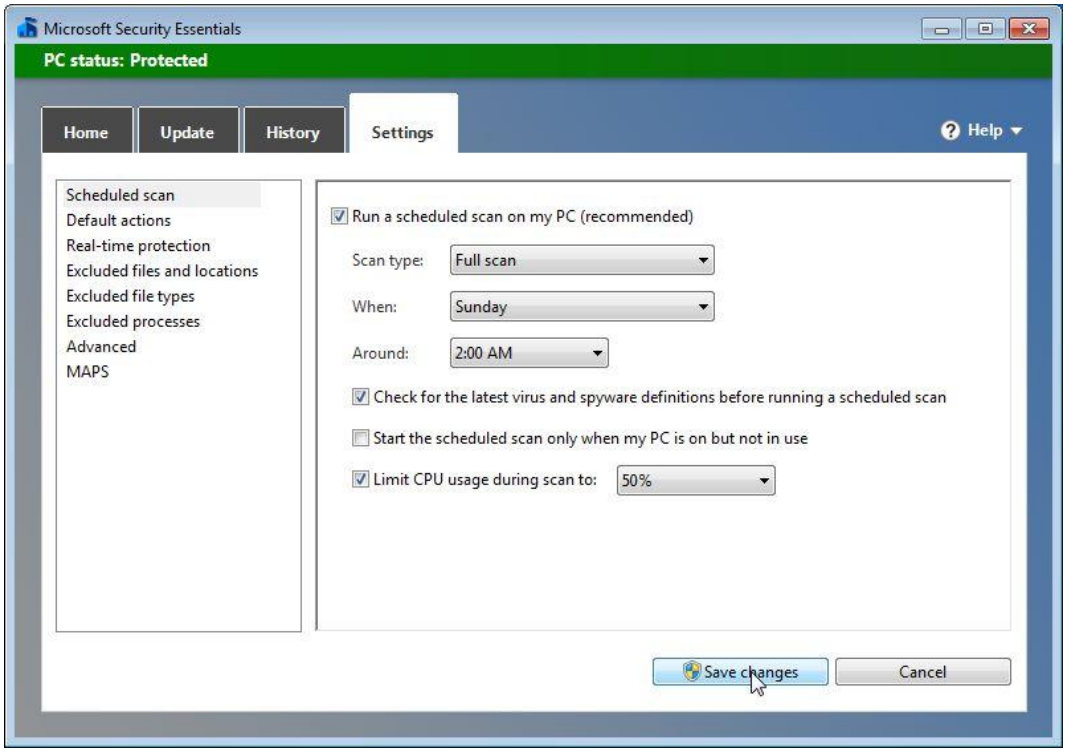
Microsoft Security Essentials
Microsoft Security Essentials
Completing the Microsoft Security Essentials Installation Wizard
You have successfully completed the Security Essentials Installation Wizard.
Click Finish to complete the installation. Security Essentials will start automatically and check for the latest virus and spyware definitions.
Scan my computer for potential threats after getting the latest updates.
Finish

We then tick to scan the computer upon completion of installation and then click "finish",




Once the scan has completed we see that there are no threats on the PC.




We then open the "settings" tab to set the frequency of scans, where we select to run a scheduled scan every Sunday at 2am, and save changes.

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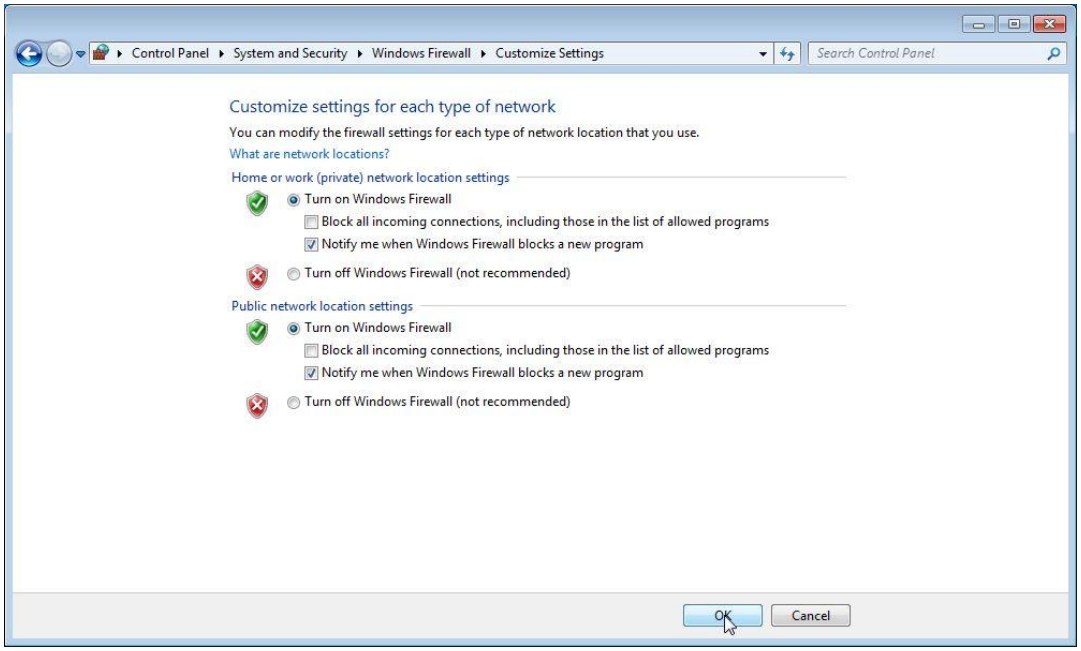
### A.2.3 - Activate Windows Firewall


Control Panel
System and Security
Windows Firewall
Customize Settings
Search Control Panel
Customize settings for each type of network
You can modify the firewall settings for each type of network location that you use.
What are network locations?
Home or work (private) network location settings
Turn on Windows Firewall
Block all incoming connections, including those in the list of allowed programs
Notify me when Windows Firewall blocks a new program
Turn off Windows Firewall (not recommended)
Public network location settings
Turn on Windows Firewall
Block all incoming connections, including those in the list of allowed programs
Notify me when Windows Firewall blocks a new program
Turn off Windows Firewall (not recommended)
OK
Cancel

WIndows firewall is activated by default with windows 7 installations, however if we wished to switch it off it is accessed by clicking the "start" menu, followed by "control panel" followed by "system and security". Within system security we click on "windows firewall" and "customise settings" which open a dialog box where the firewall could be turned off.

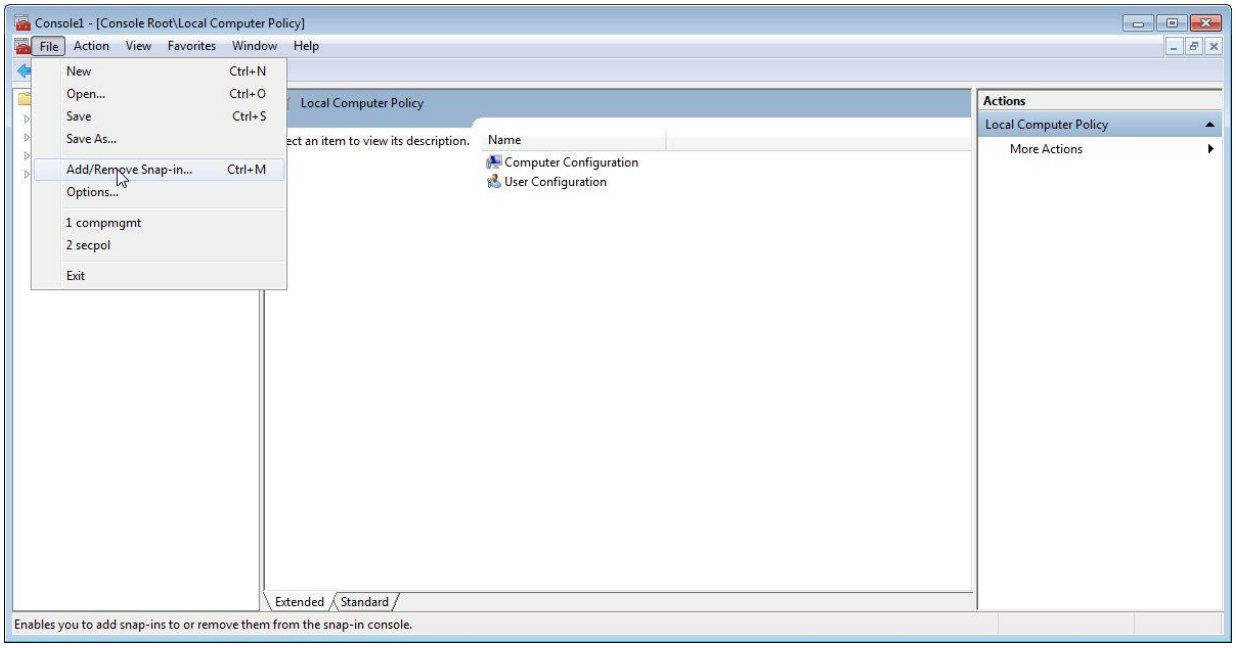
---

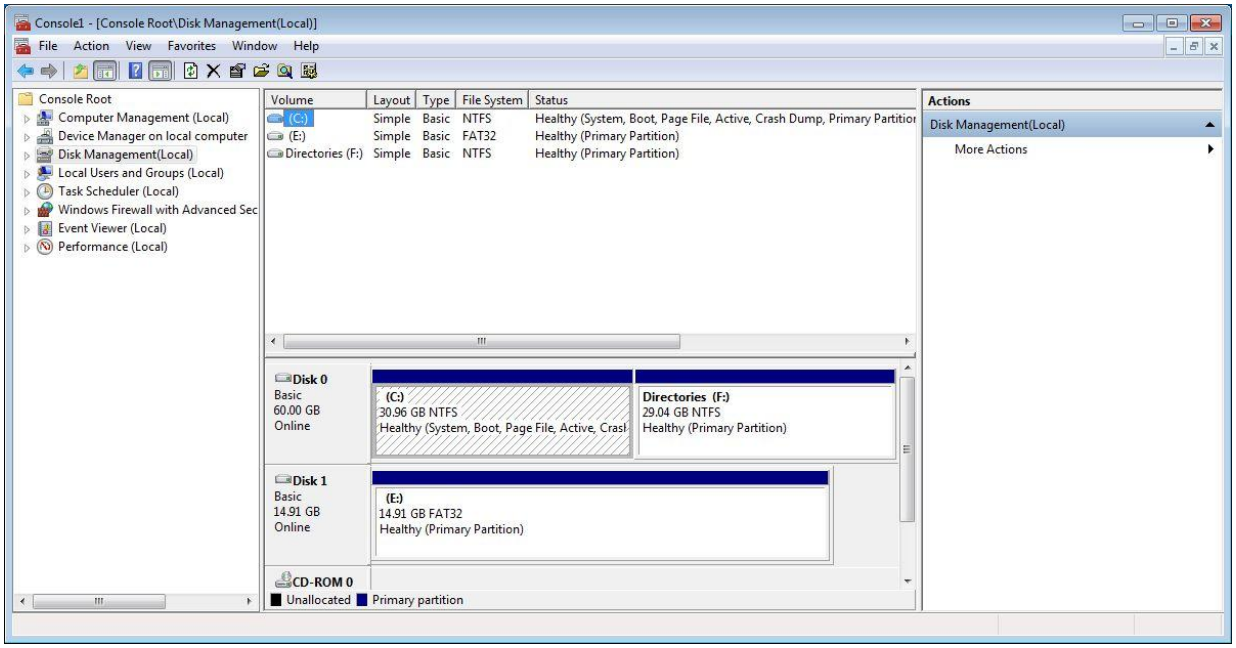
# Task A.3 - Users, Groups & Security

## A.3.1 - Implementing Security Policies

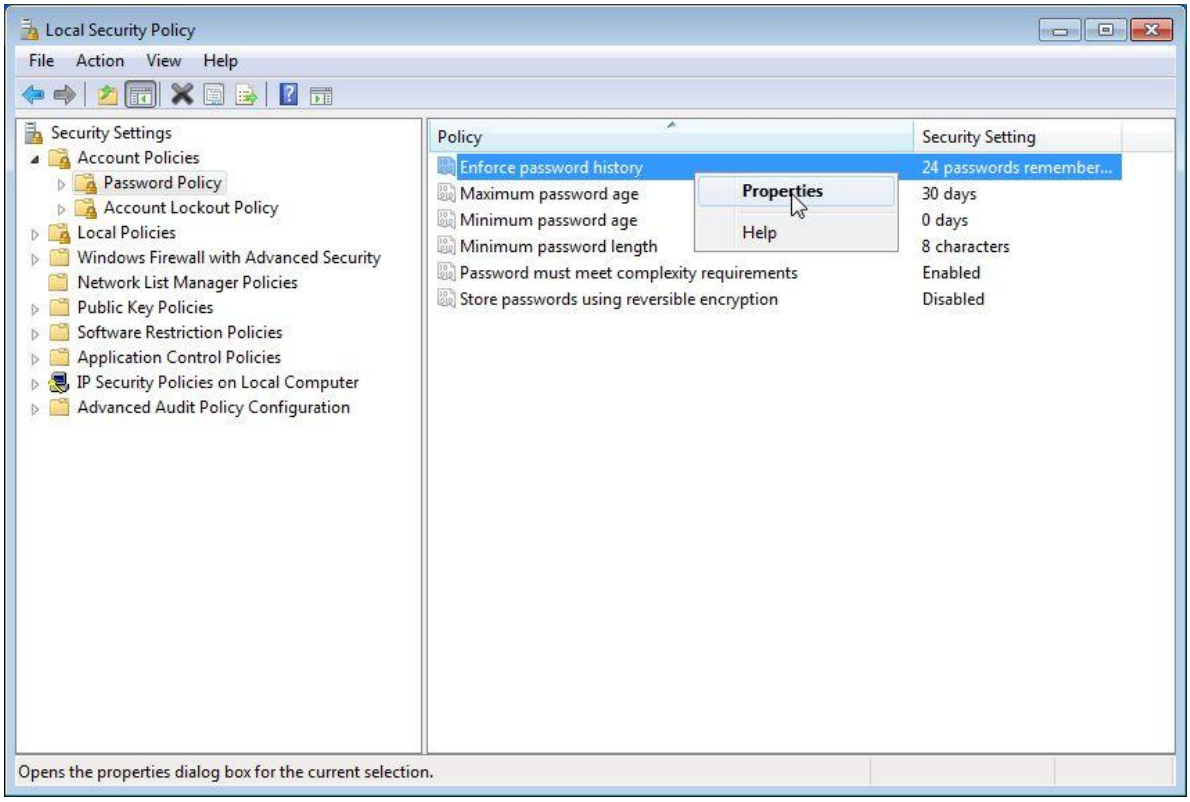
### Microsoft Management Console

The microsoft management console is a very useful tool for the IT technician. It is accessed by typing "mmc" into the search bar on the start menu which locates the mmc.exe application. When opened, the console can have frequently used utilities, such as device manager, disk management and local users and groups added as "snap-ins" to the console, which can be saved for future use.

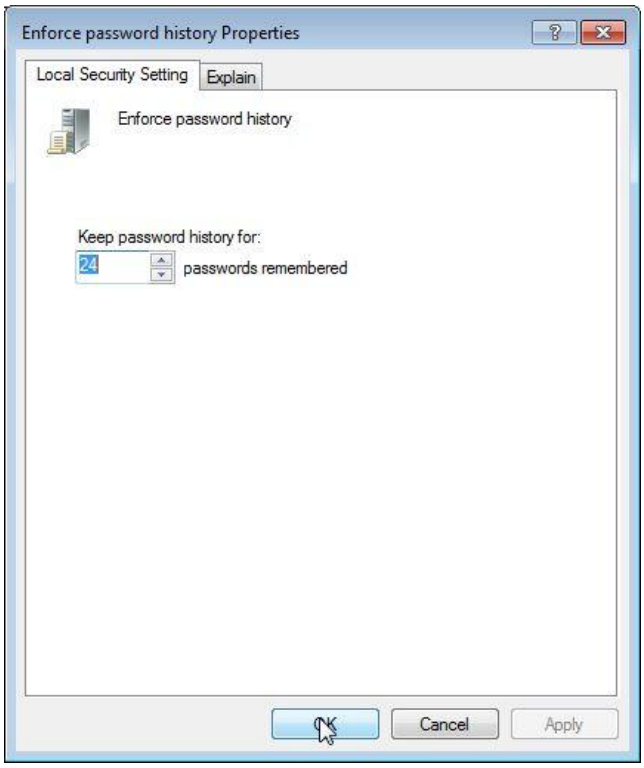


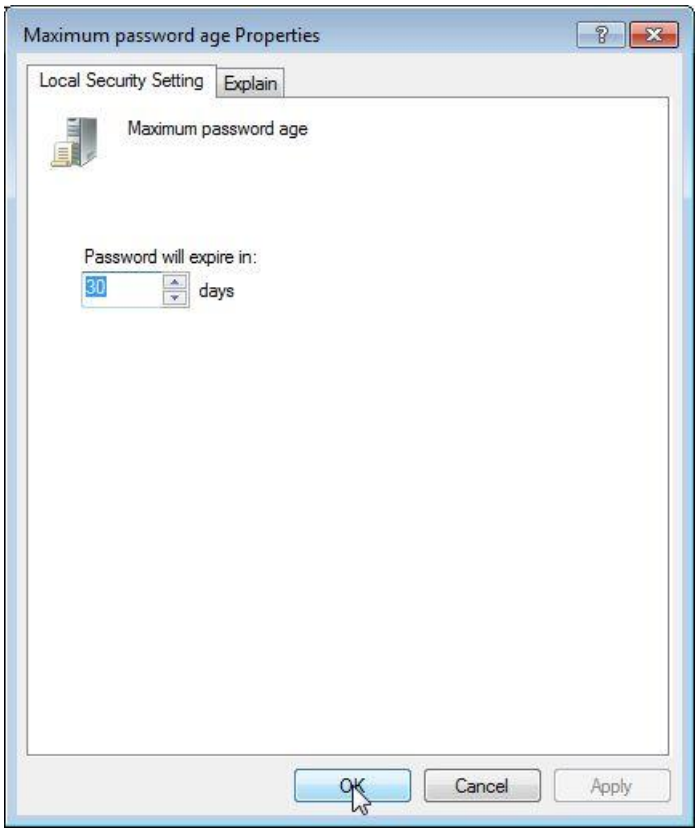
Security policies in relation to passwords and logons are implemented from the local security policy interface, which can be accessed by typing "local security" into the search bar on the start menu, and opening the search result.



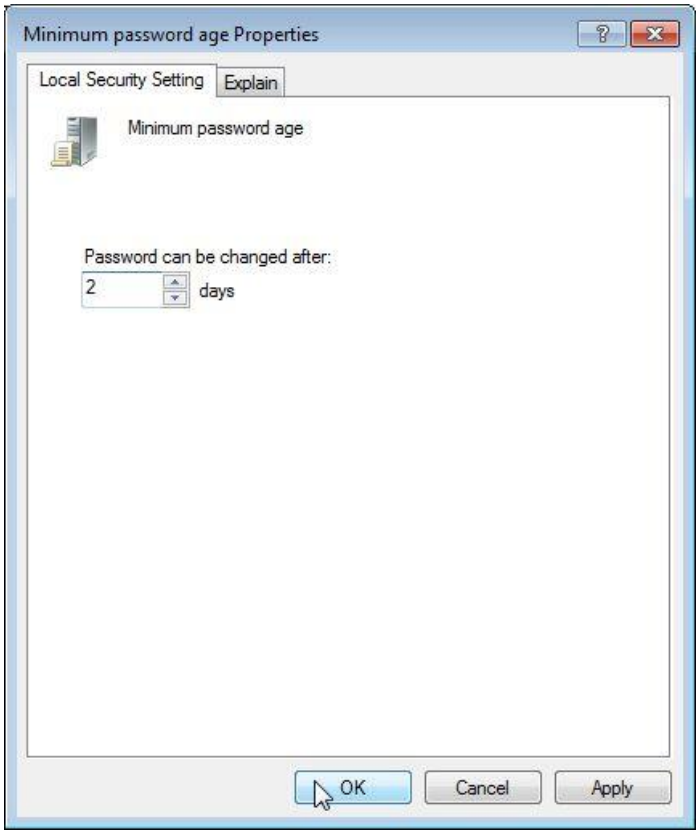

When we open the interface, we can then expand the account policies folder, followed by the password policy folder, which then allows us to right click on the various elements of the password and account lockout policies, and set them in accordance with best practice.



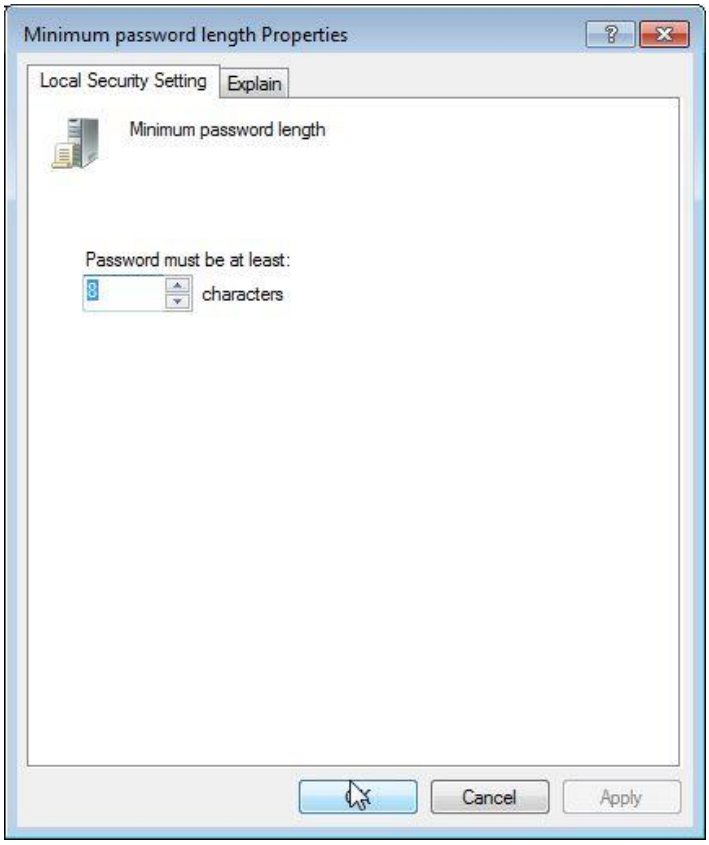

We set the password history to remember the last 24 passwords used to ensure that passwords are not reused.



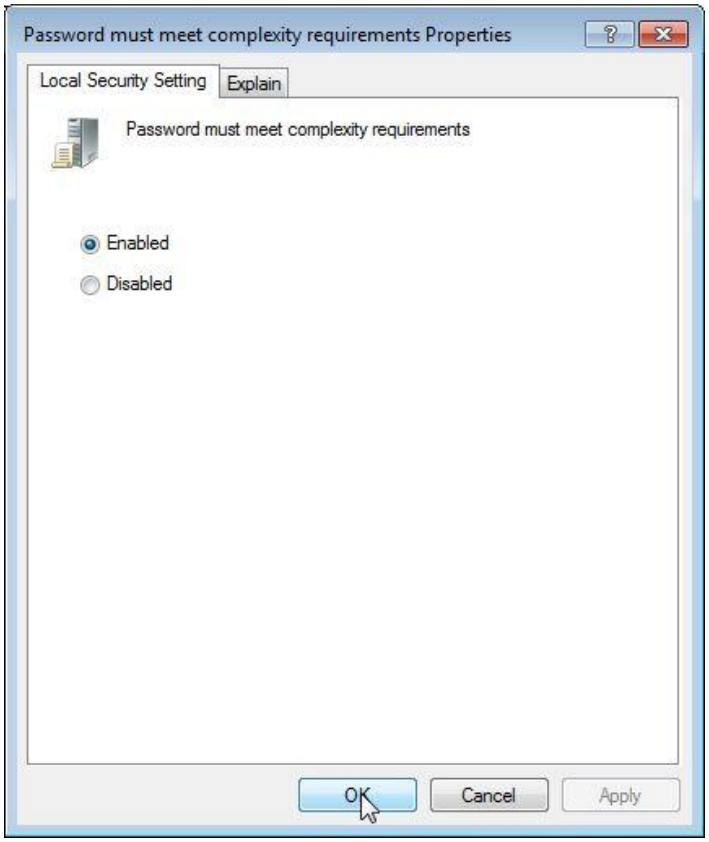

We set the maximum password age as 30 days.



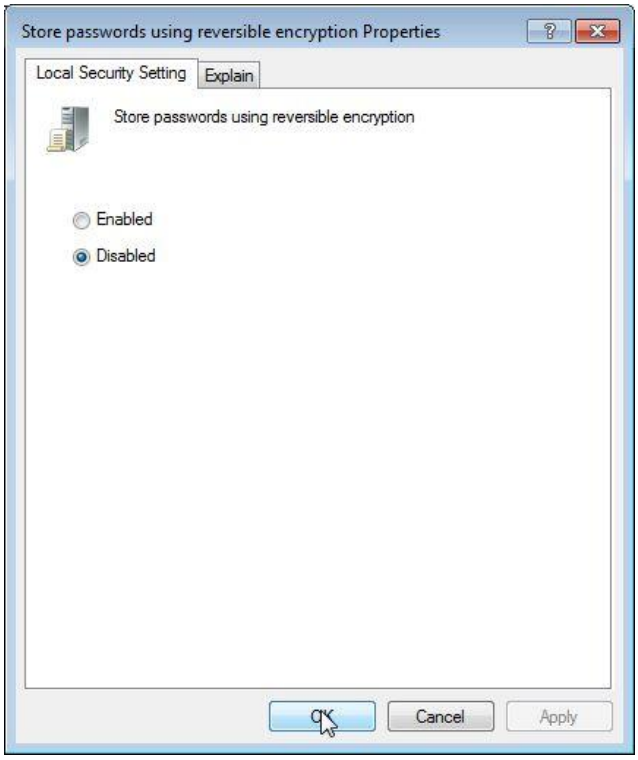

We set the minimum age of passwords as 2 days.




We set the minimum password length as 8 characters.



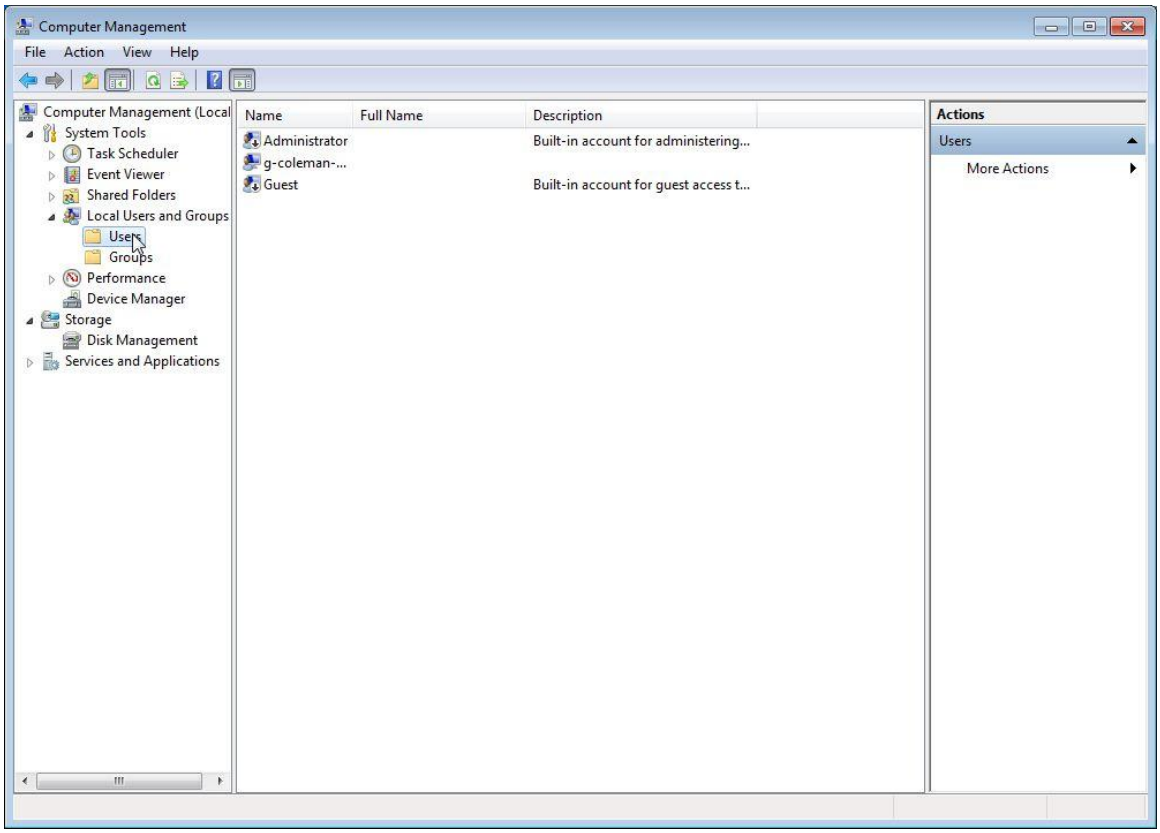

We enable complexity requirements of passwords, i.e. mixture of letters, numbers and characters.



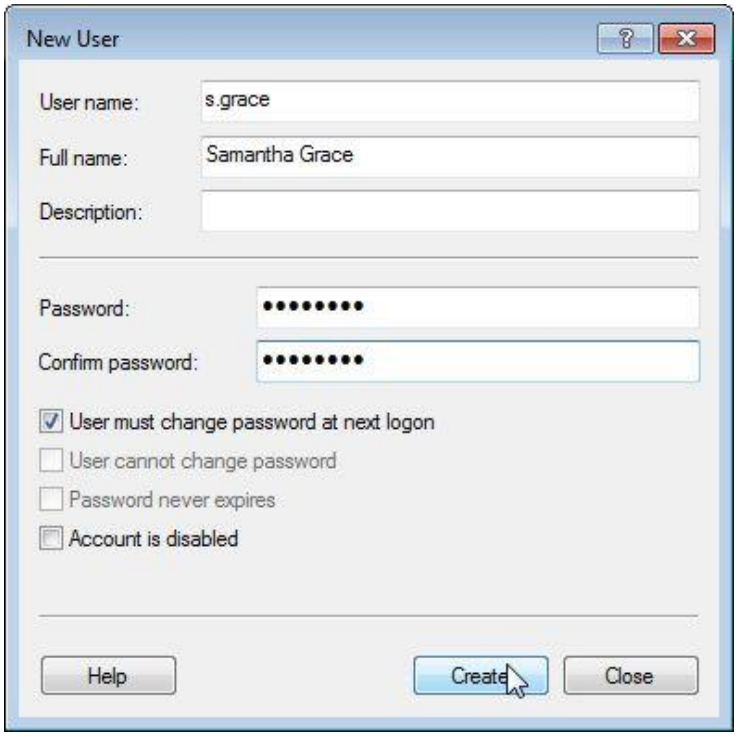

Passwords are not stored using reversible encryption as this is a security risk in a business environment, and is better suited for home and personal use.

---

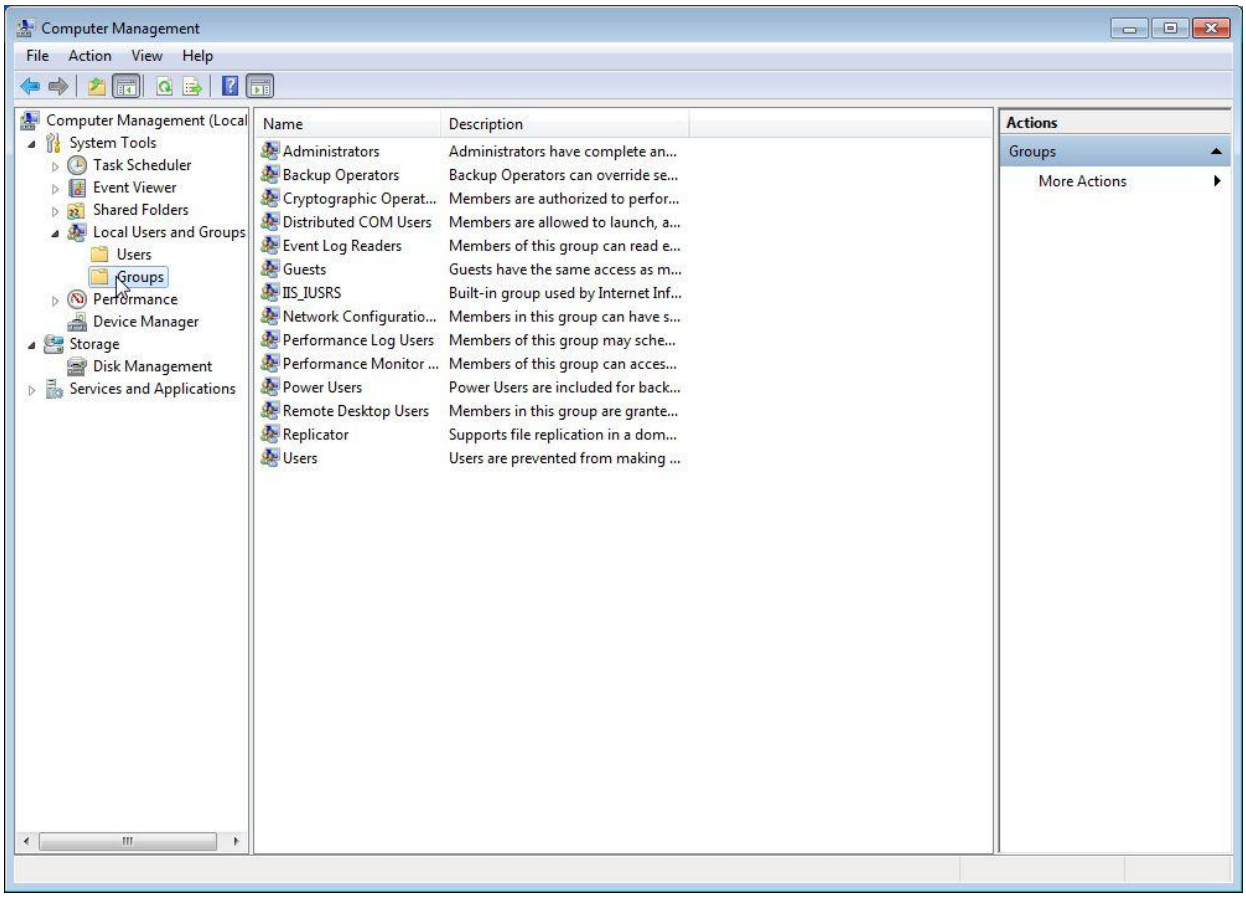
### A.3.2 - Creating Users and Groups



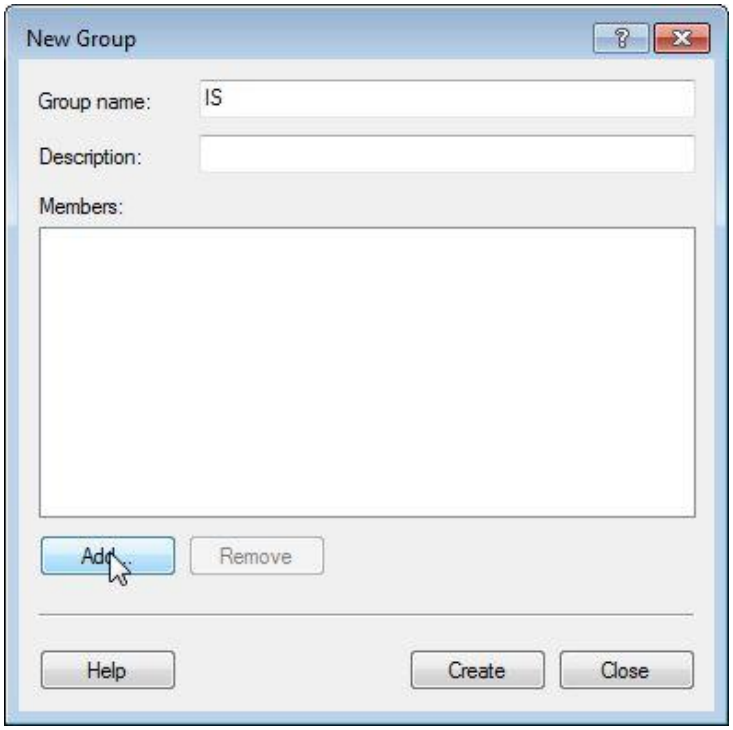

Using the microsoft management console, we expand the "local users and groups" snap-in, and right click on "users" and select "new user".



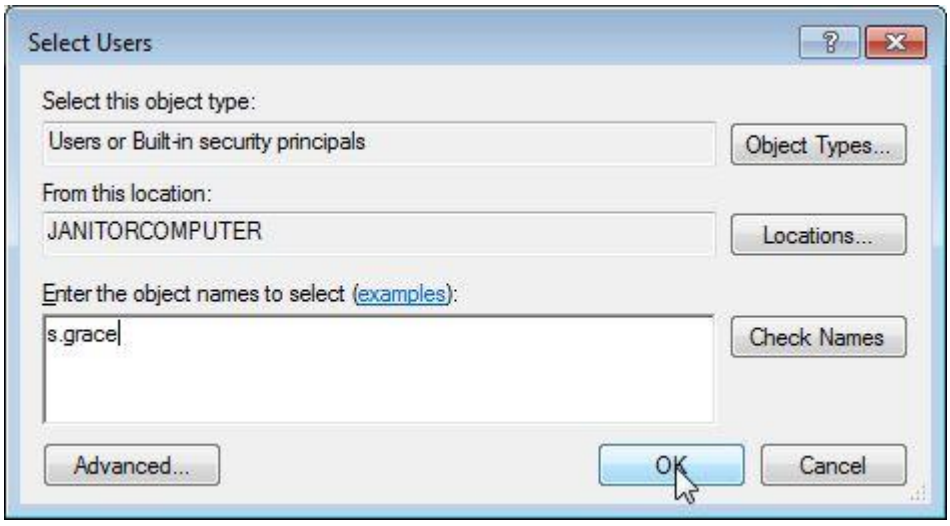

This opens the "new user" dialog box, where we enter the desired user name, using firstinitial.surname, and password for each of the specified users, and then click "create" to create each new user.



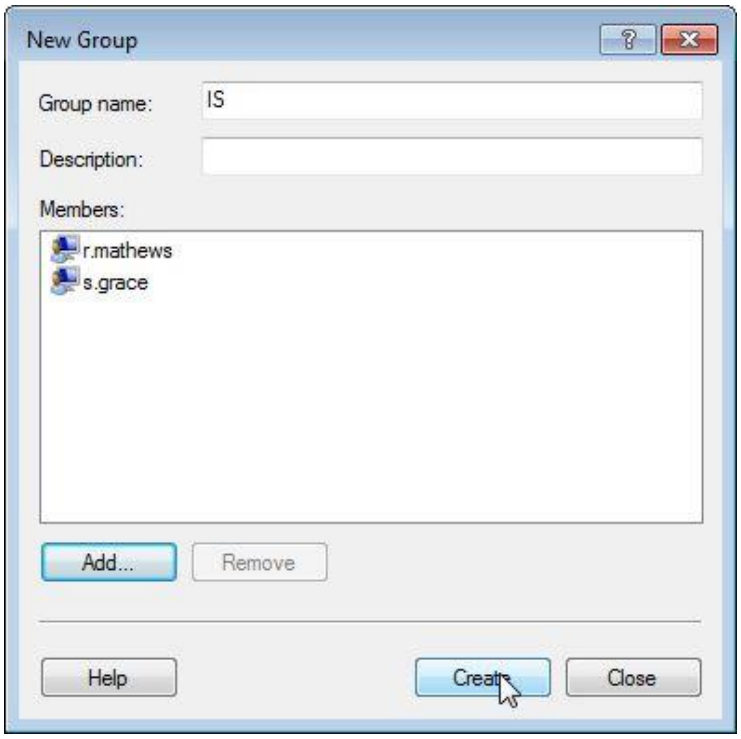

Back at the "local users and groups" snap-in, we right click on the "groups" folder, and select "new group".



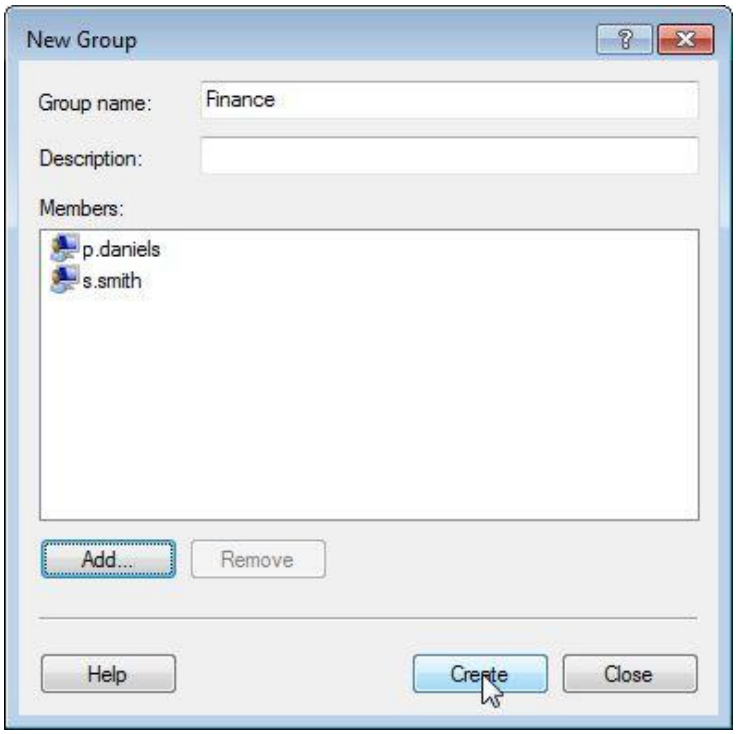

This opens the "new group" dialog where we enter the name and description of each of the specified groups, and click "add" to add the specified members to each group.



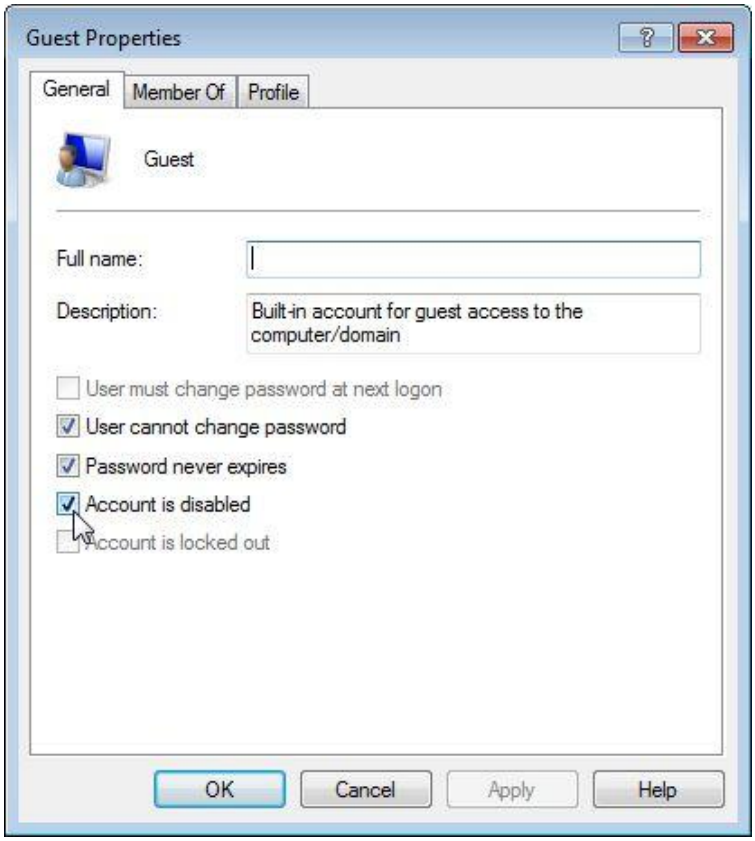

We type in the user name to be assigned to the group and click "check names", selecting "ok" to add a given user to the group.



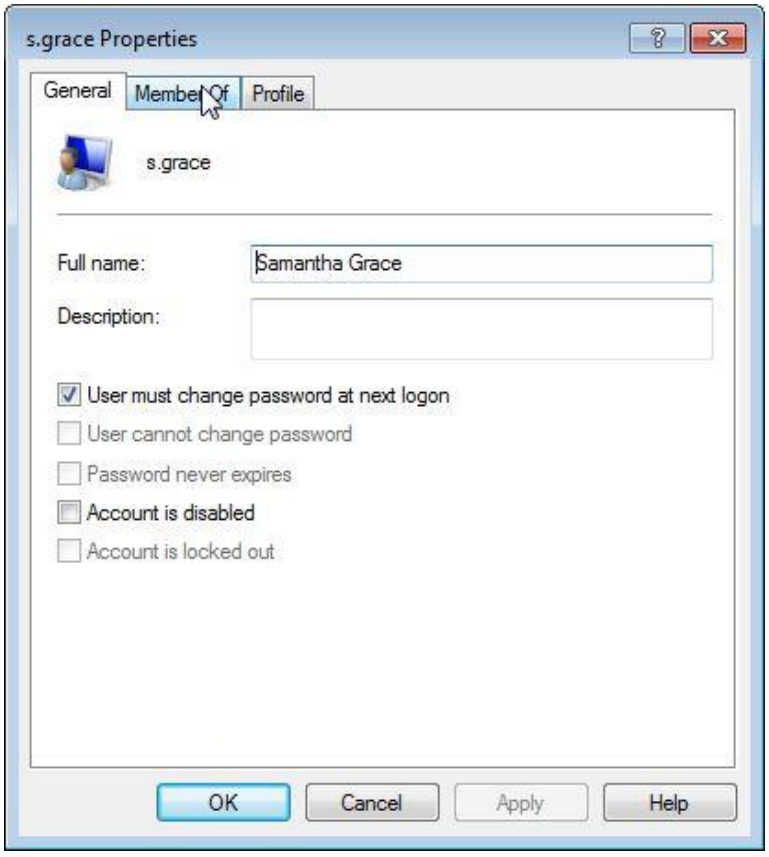

Once the user has been added to the group we click on "create" to create that group.



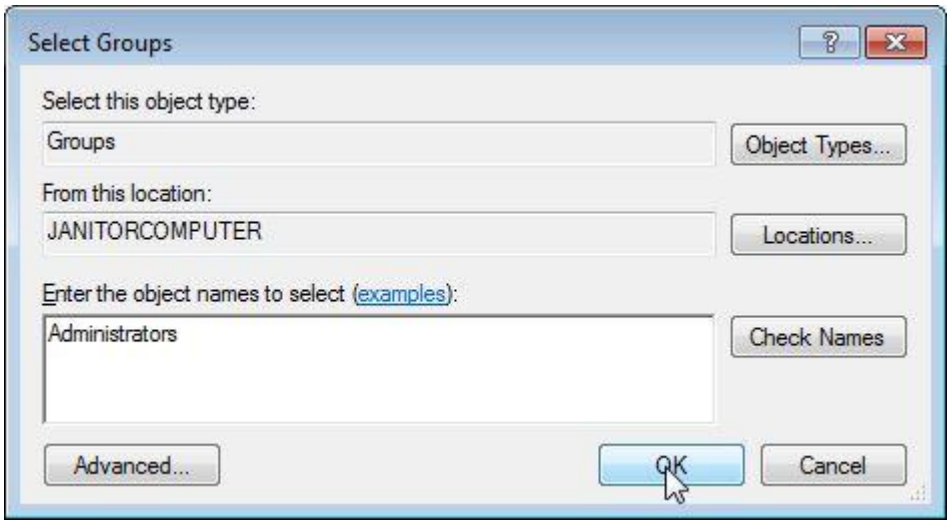

This process is repeated for each of the specified groups.



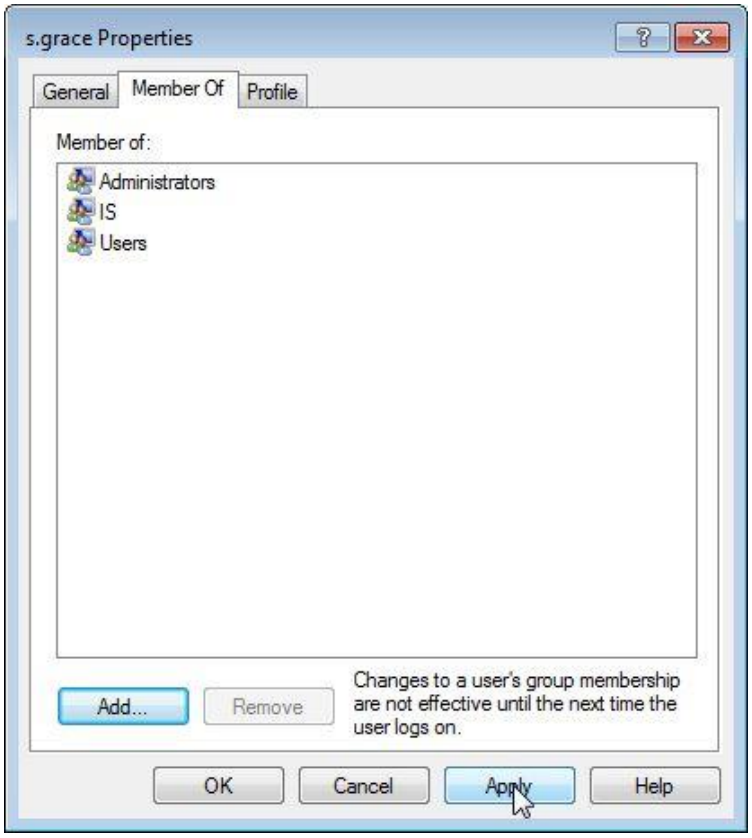

It is good policy to disable the "guest" user, to eliminate this potential security risk.




The user Samantha Grace is to be given membership to an administrators group, this group is set up by default and so we add her to this group. From the "local users and groups" snap-in we right click on user Samantha Grace and select "properties".




We click on the "member of" tab within the user's properties dialog and enter "administrators" into the "check names" field and click "ok"




User Samantha Grace is now a member of the IS group and the Administrators group.

### A.3.3 - Share vs NTFS Permissions

Before we create our folder structures and look at security of files and folders, it is worth taking a moment to clarify the concept of share permissions compared to NTFS.

Share permissions are the permissions we set for a folder when we share that folder. Share permissions are not applied to files. The share permissions determine the type of access users have to the shared folder when the resource is being accessed over the network. Share permissions are not evaluated when users are logged into the machine locally. There are three types of share permissions: Full Control, Change, and Read.

NTFS permissions determine the action users can take for a file or folder when accessed locally. When both permissions are in place, the most restrictive permission will be applied to the user accessing the resource.

If we are logged on a computer locally, the share permissions applied to a folder have no impact on the us. In a scenario where the user is logged on locally, only the NTFS permissions are evaluated. If we are accessing a resource (file, folder, etc...) over the network, then the share and NTFS permissions are combined. The most restrictive permission is the effective permission.

In practice it is generally acceptable to set the share permissions to "Authenticated Users/Full Control" and manage the permissions via the NTFS Security tab.

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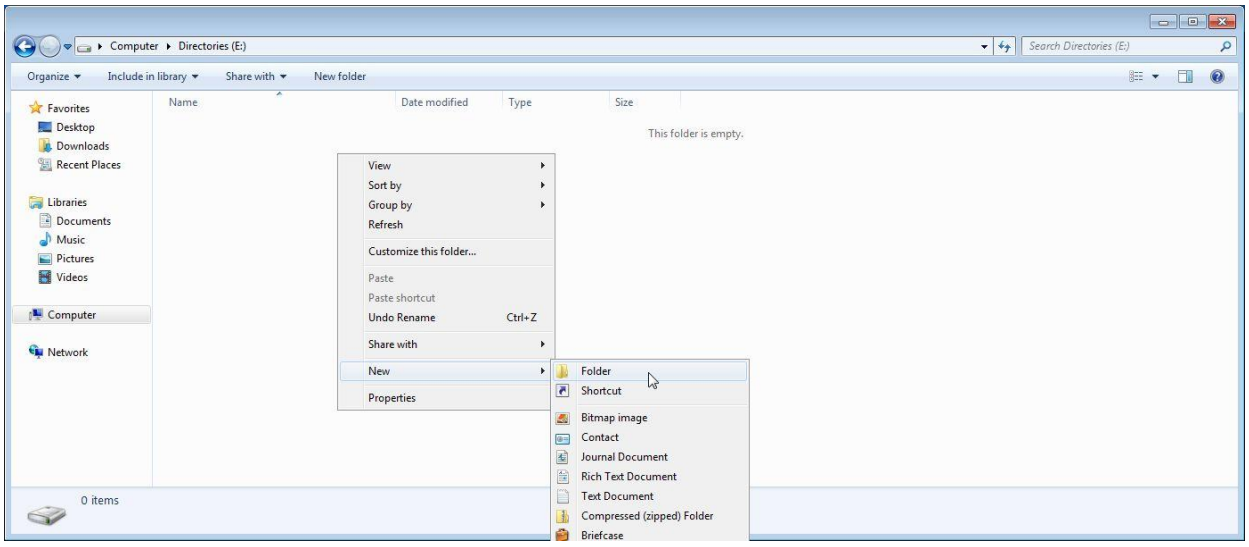
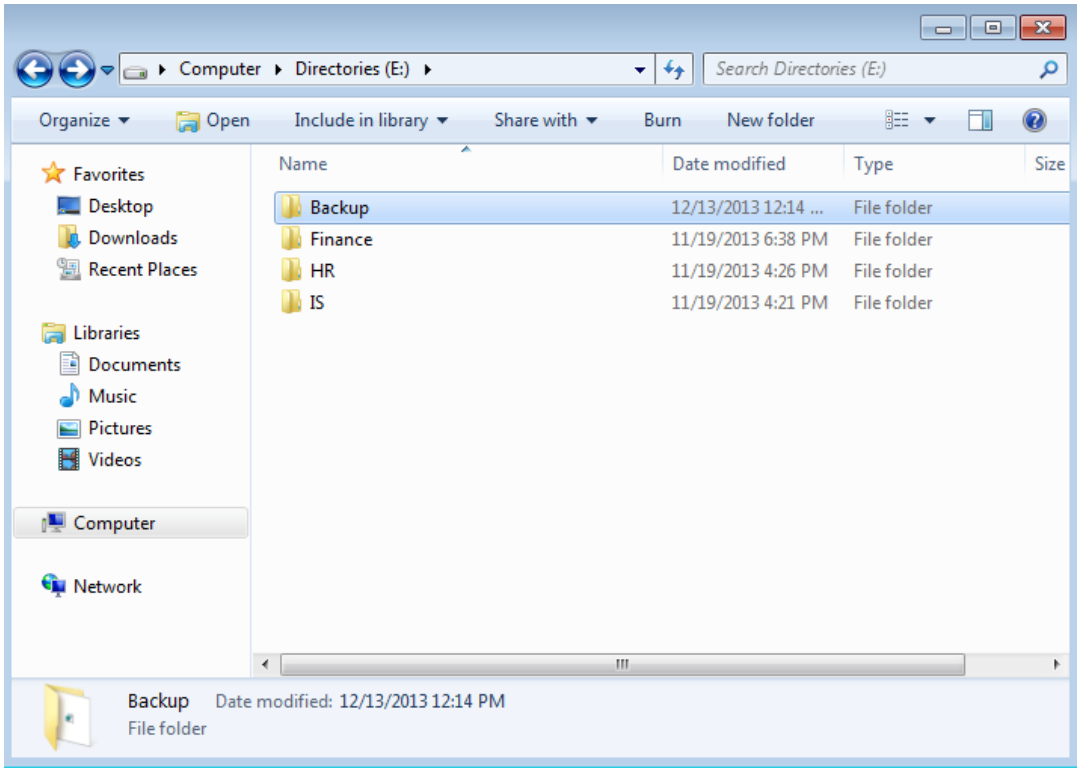
### A.3.4 - Creating Folder Structure

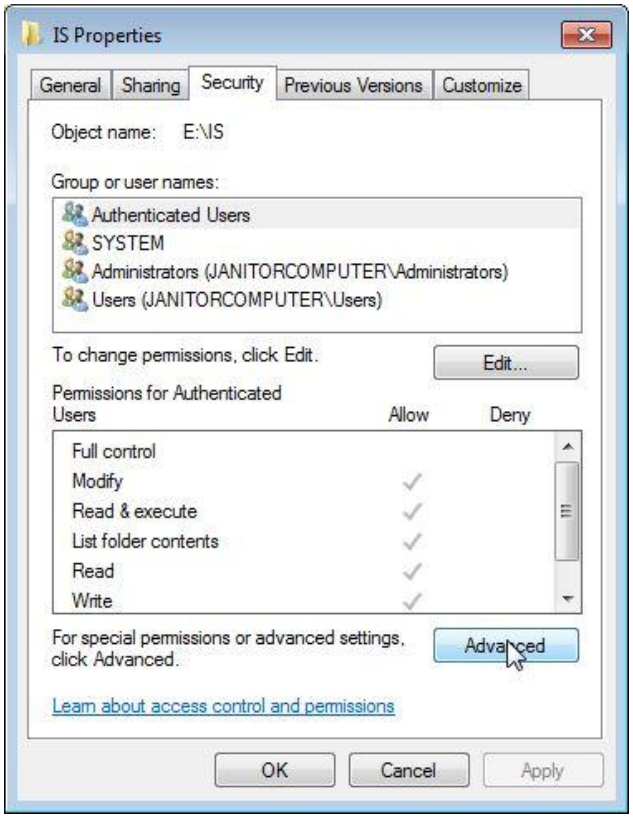



Department and User folders are to be created on the second partition which was created earlier. Therefore from the start menu we select "computer" and double click on the "E" directory. From the resultant window we right click within the whitespace for the directory and

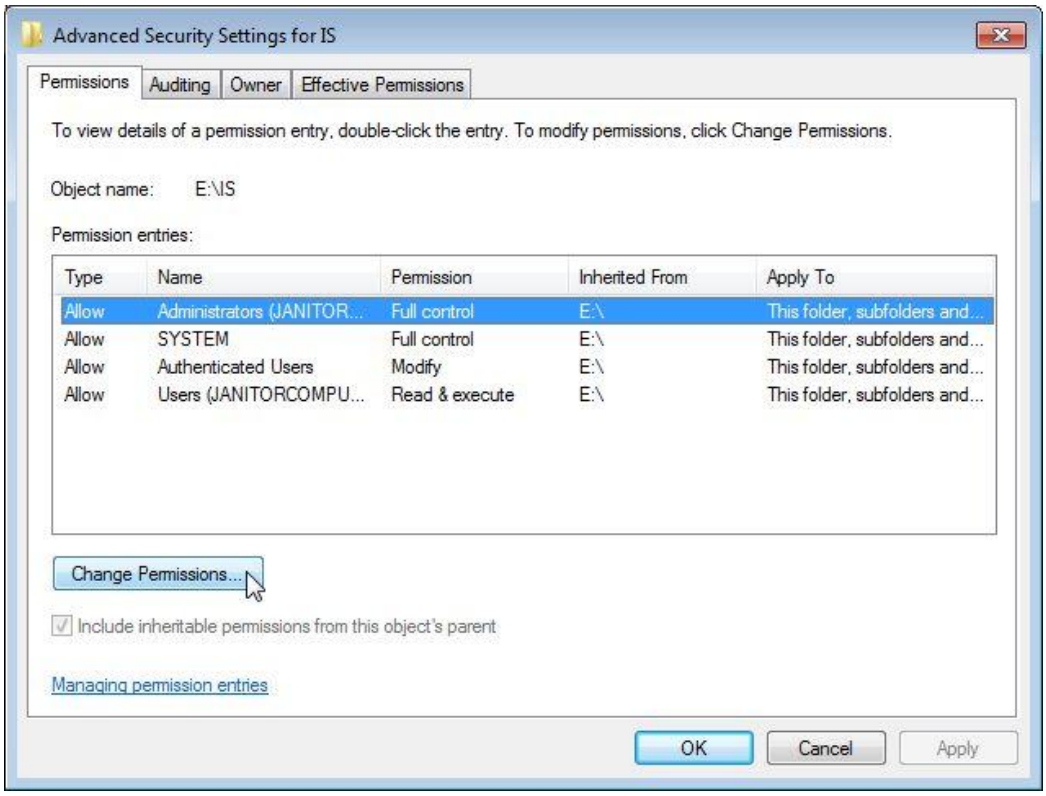
select "new", and then "folder", entering the name of the relevant department to receive a folder.



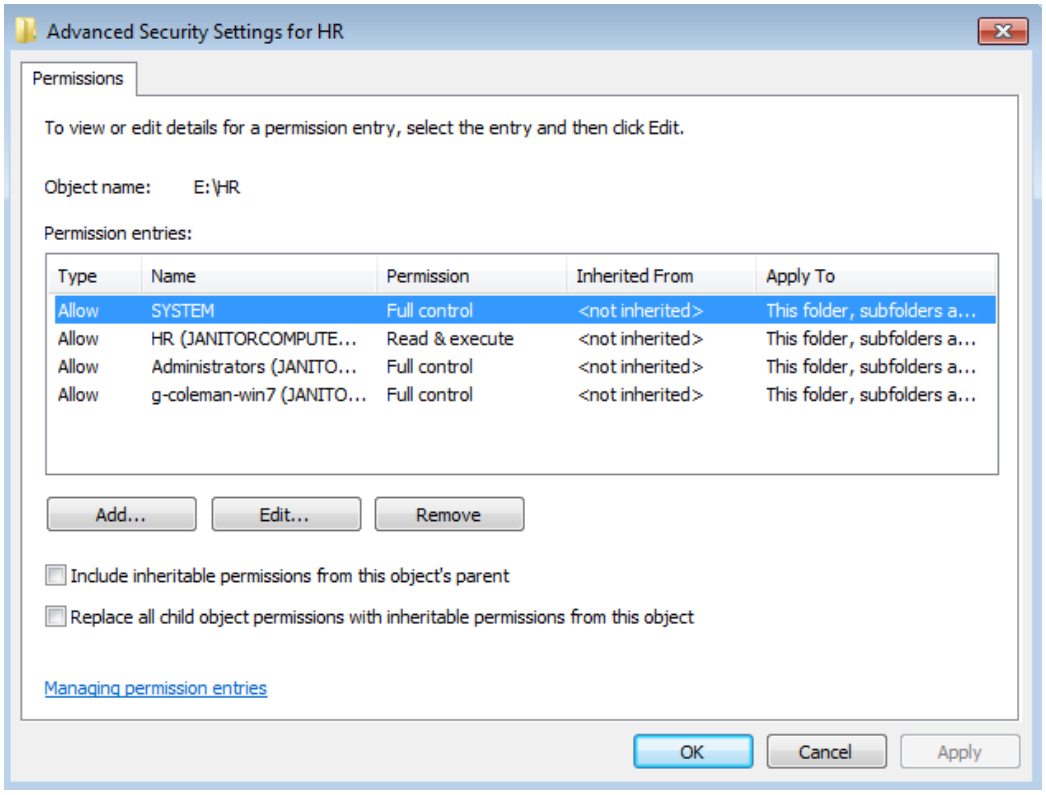

This process is repeated for each of the three departments.




Before we create individual folders for each user, we must disable the inheritable permissions feature that is a default attribute of NTFS permissions. We double click on "computer" from the start menu, and from the resultant window we right click on the department folder and select "properties", followed by "security" followed by "advanced".


Advanced Security Settings for IS
Permissions
Auditing
Owner
Effective Permissions
To view details of a permission entry, double-click the entry. To modify permissions, click Change Permissions.
Object name: E:\IS
Permission entries:
Type Name Permission Inherited From Apply To
Allow Administrators (JANITOR... Full control E:\ This folder, subfolders and...
Allow SYSTEM Full control E:\ This folder, subfolders and...
Allow Authenticated Users Modify E:\ This folder, subfolders and...
Allow Users (JANITORCOMPU... Read & execute E:\ This folder, subfolders and...
Change Permissions...
Include inheritable permissions from this object's parent
Managing permission entries
OK
Cancel
Apply

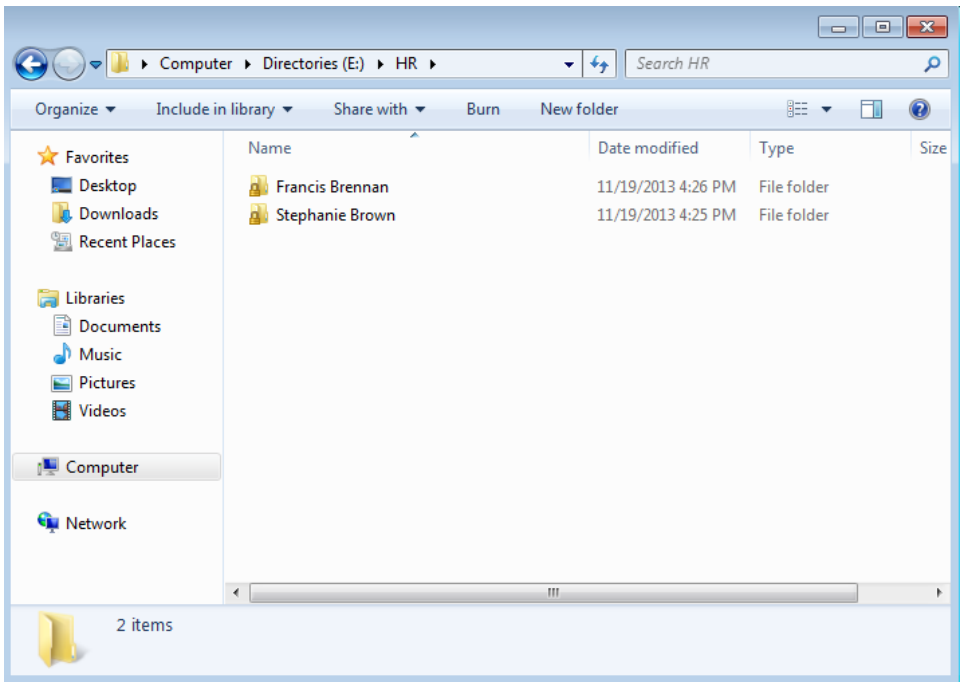
This opens the advanced security settings for the folder we are working on, where, from the "permissions" tab, we click on "change permissions".


Advanced Security Settings for HR
Permissions
To view or edit details for a permission entry, select the entry and then click Edit.
Object name: E:\HR
Permission entries:
Type Name Permission Inherited From Apply To
Allow SYSTEM Full control <not inherited> This folder, subfolders a...
Allow HR (JANITORCOMPUTE... Read & execute <not inherited> This folder, subfolders a...
Allow Administrators (JANITO... Full control <not inherited> This folder, subfolders a...
Allow g-coleman-win7 (JANITO... Full control <not inherited> This folder, subfolders a...
Add...
Edit...
Remove
Include inheritable permissions from this object's parent
Replace all child object permissions with inheritable permissions from this object
Managing permission entries
OK
Cancel
Apply

We then untick "include inheritable permissions from this object's parent"

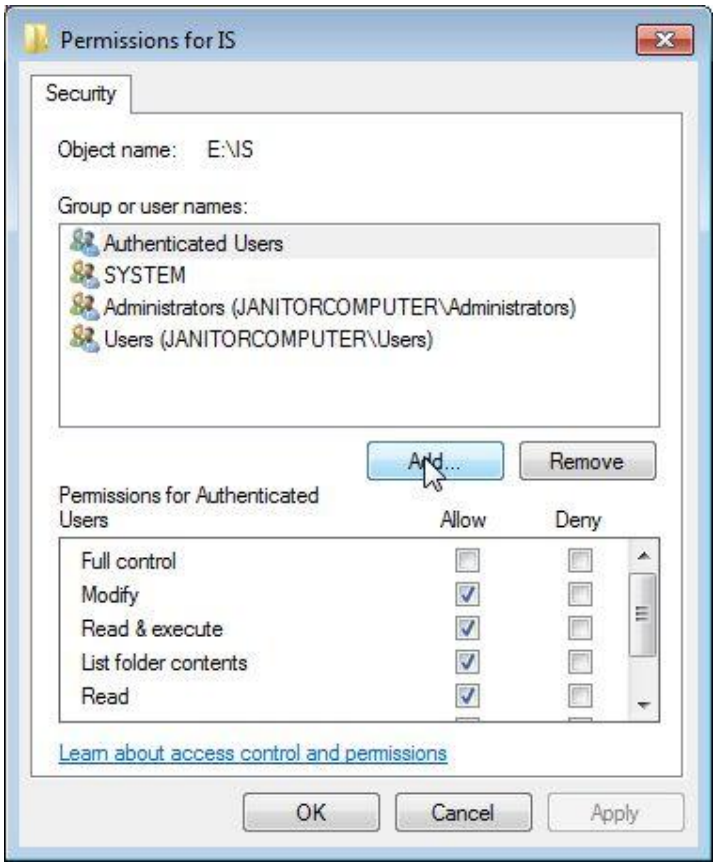
Windows Security
Warning: If you proceed, inheritable parent permissions will no longer propagate to this object.
- Click Add to convert and add inherited parent permissions as explicit permissions on this object.
- Click Remove to remove inherited parent permissions from this object.
- Click Cancel if you do not want to modify inheritance settings at this time.
Add
Remove
Cancel

We then click on "add" to add the current permissions to the folder we are working on, otherwise there will be no permissions associated with the folder and no users will be able to access it

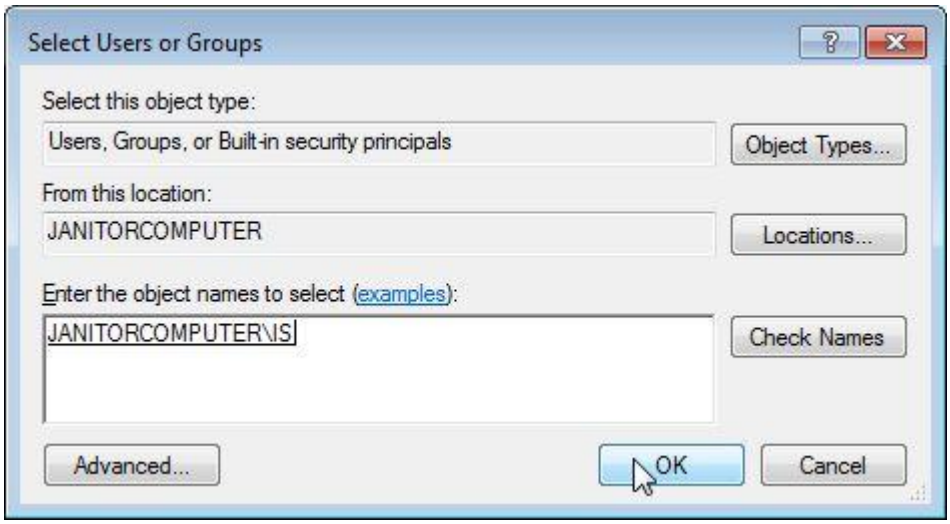



Following this, within each department folder the earlier folder creation process is repeated to create a folder for both users in each department.

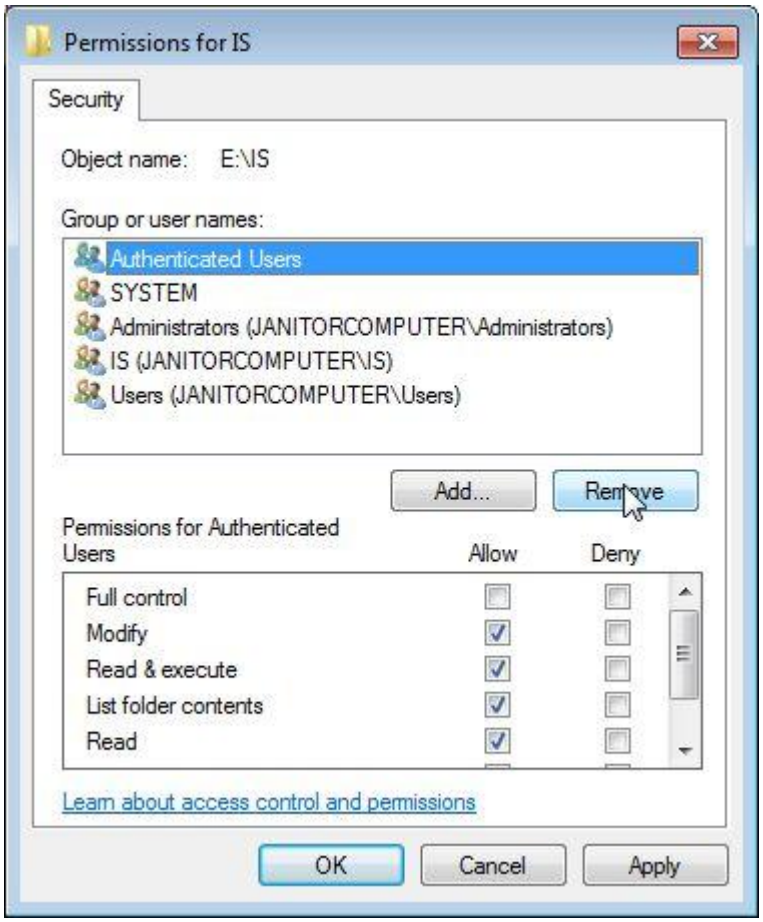
We are now ready to set permissions for each folder. The folder permissions will be set so that only department members have access to their respective department folders.



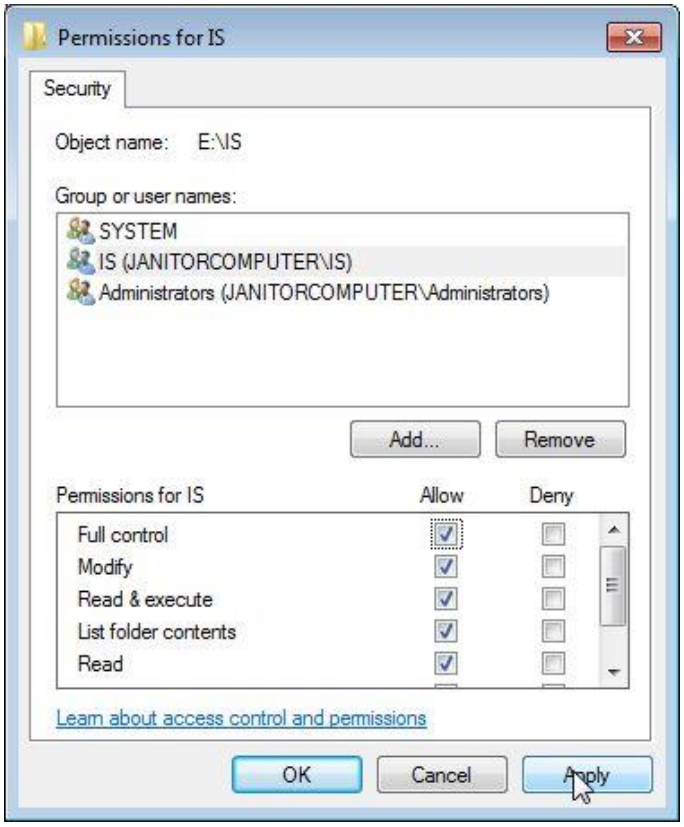

We right click on the folder and select "properties", followed by "security" and we then under "permissions for authenticated users" we tick the box for "full control", followed by clicking "add".



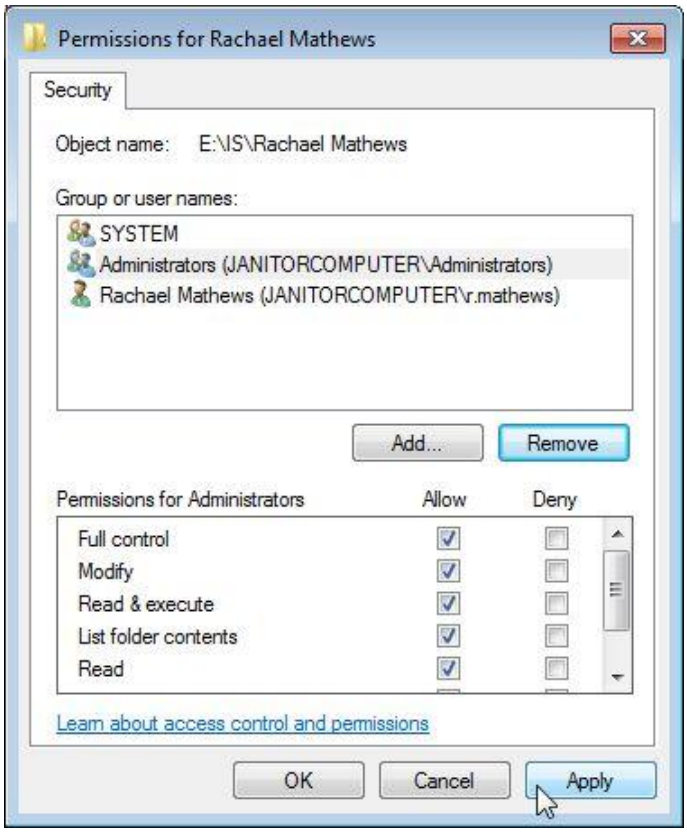

We then enter the name of the group who will have access to the folder in the "enter the object names to select field" and click "ok".



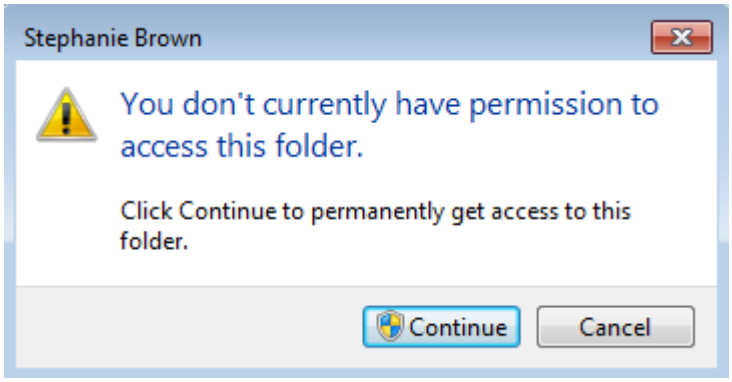

We are then returned to the permissions dialog where we can see that the specified group are now granted permissions to the folder. The next step is to remove other groups who will not have access, in this case the "authenticated users" and "users" groups.




This leaves the only groups with access to the folder being the specified group and the administrators group, who have full access to all of the folders.




This process is repeated for each of the individual user folders within each department folder, except that instead of granting permission to a group we grant it to the user who is the owner of the folder.


Stephanie Brown
You don't currently have permission to access this folder.
Click Continue to permanently get access to this folder.
Continue
Cancel

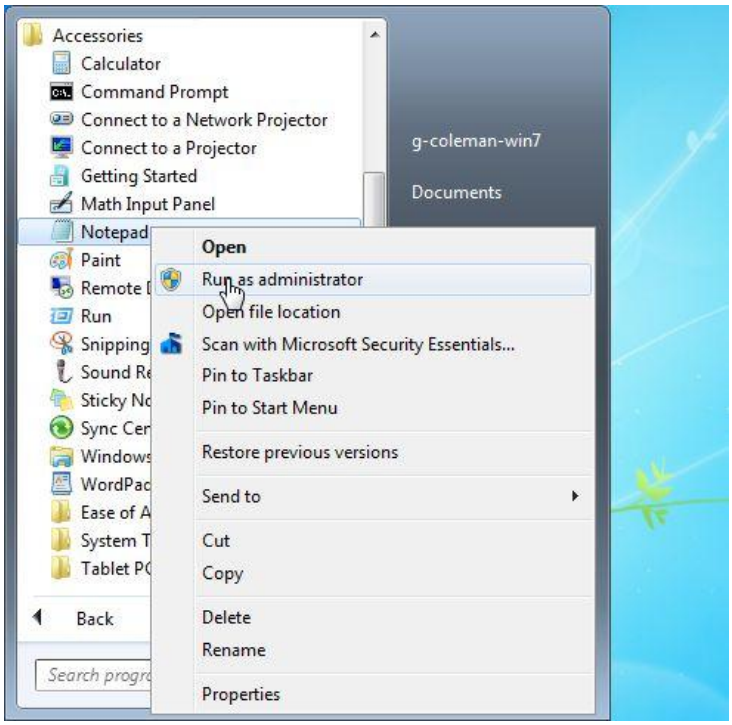
In order to test that the security permissions have been implemented we log in as a non-administrator user, and when we attempt to open a department folder that is not the user's group, or the personal folder of the other group member within that users group, the pop-up message "you don't currently have permission to access this folder" is displayed.

The above permissions, being NTFS permissions affect both local and remote access. Share permissions (which are accessed by right clicking on a folder and selecting the "share" tab), by contrast, apply only to shared network resources, and would not provide privacy between users on a computer that is used by several users.

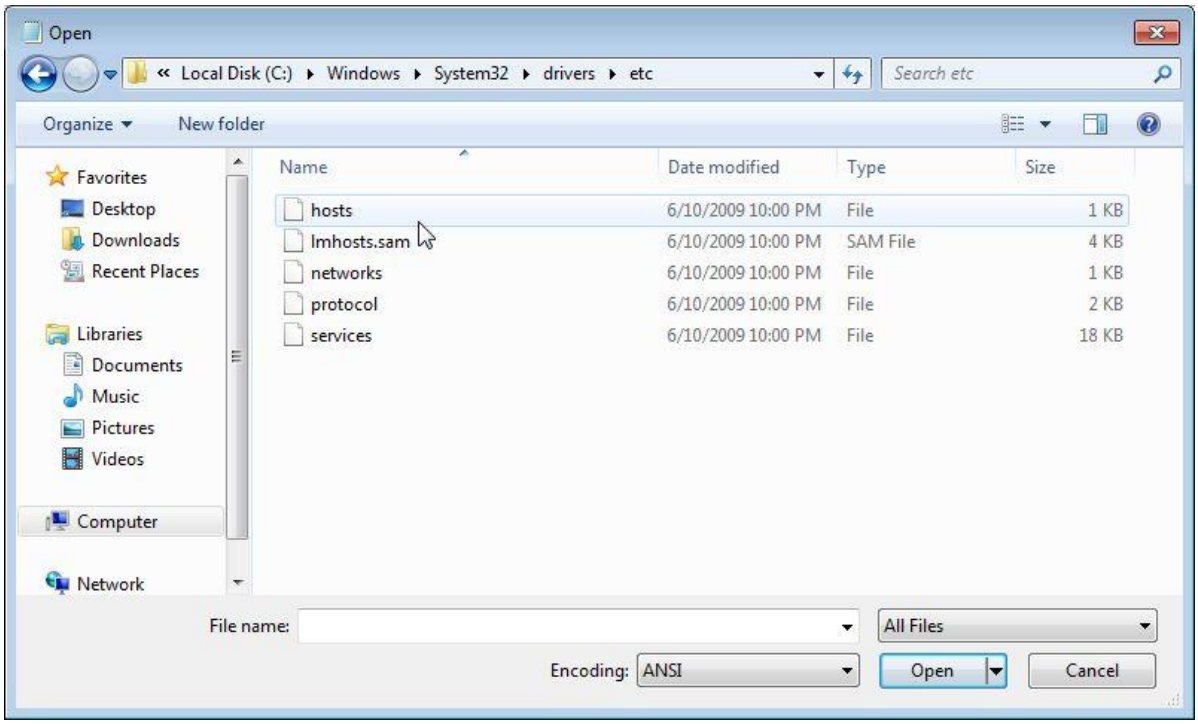
---

### A.3.5 - Blocking Access to Social Media Sites

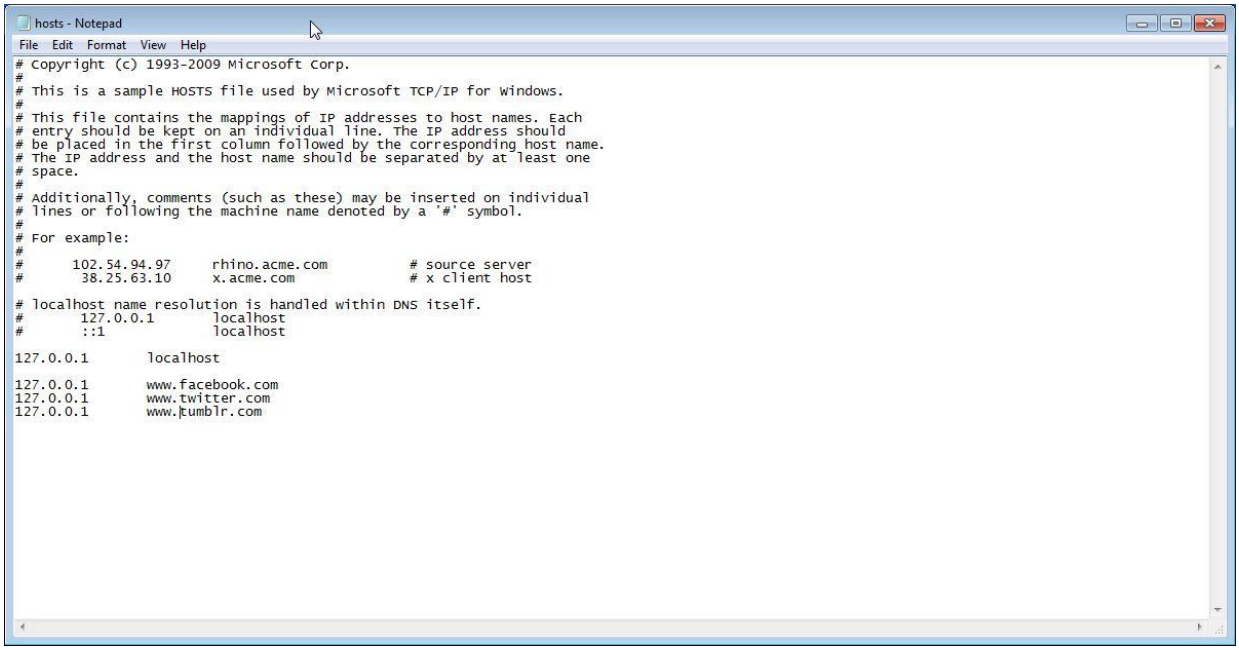
In accordance with best practice and company policy, we will now block access to three common social media sites.



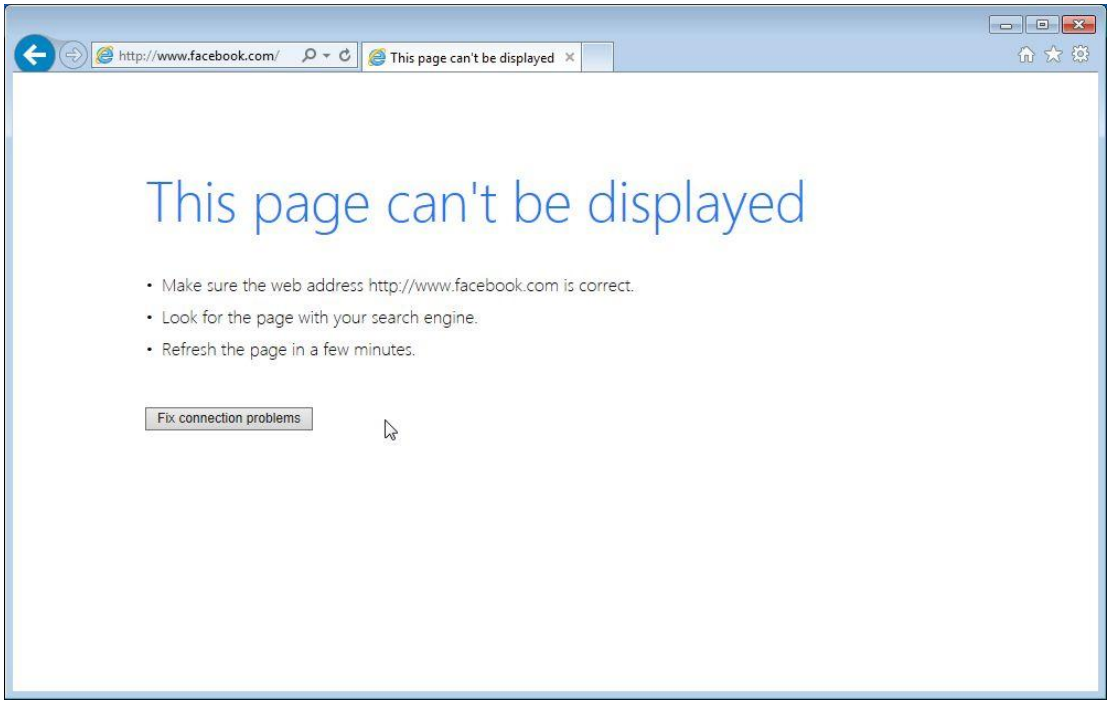

From the "start" menu we click "all programs" followed by "accessories" where we right click on "notepad" and chose to "run as administrator".




When notepad opens we click on "file" followed by "open" and we navigate to local disk (C)/ Windows / System 32 / Drivers / etc, which is where the host file is located, and which we open.


hosts - Notepad
File Edit Format View Help
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
# 102.54.94.97 rhino.acme.com # source server
# 38.25.63.10 x.acme.com # x client host
# localhost name resolution is handled within DNS itself.
# 127.0.0.1 localhost
# ::1 localhost
127.0.0.1 localhost
127.0.0.1 www.facebook.com
127.0.0.1 www.twitter.com
127.0.0.1 www.tumblr.com

As the host file is a system file we must be running notepad as administrator in order to save any changes made to it. At the bottom of the host file we can now add the addresses of the sites to be blocked, following the convention 127.0.0.1 (the computer's loopback IP address) followed by www.websitename.com. We then save the edited host file.


http://www.facebook.com/
This page can't be displayed
This page can't be displayed
• Make sure the web address http://www.facebook.com is correct.
• Look for the page with your search engine.
• Refresh the page in a few minutes.
Fix connection problems

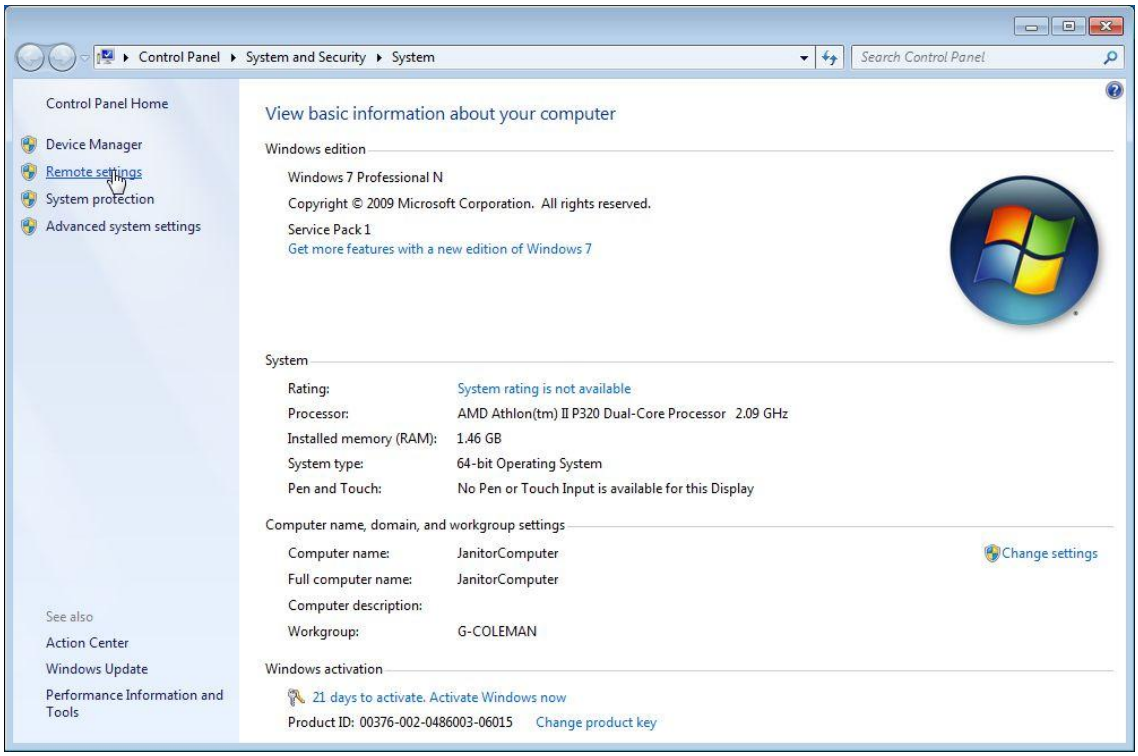
When we attempt to access one of the blocked websites we can see that it is no longer accessible.

---

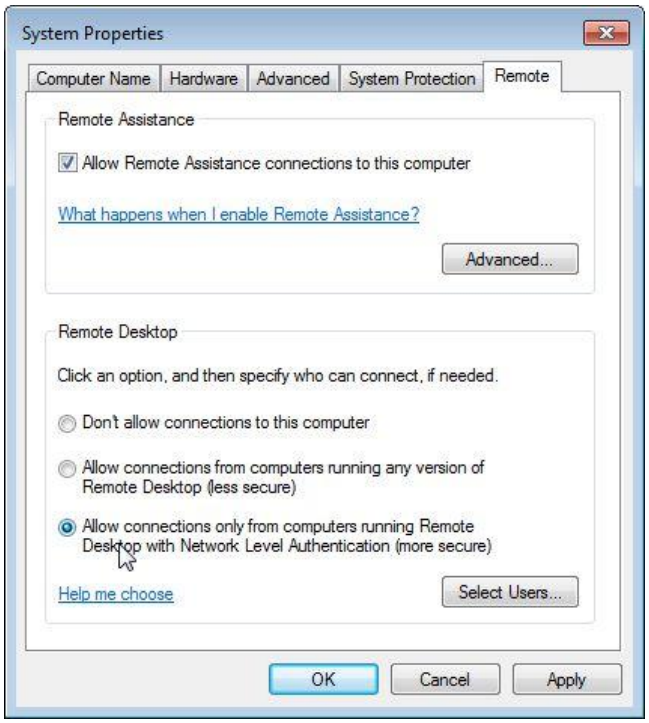
## Task A.4 - Remote Connectivity

### A.4.1 - Set up Remote Desktop for Administrators

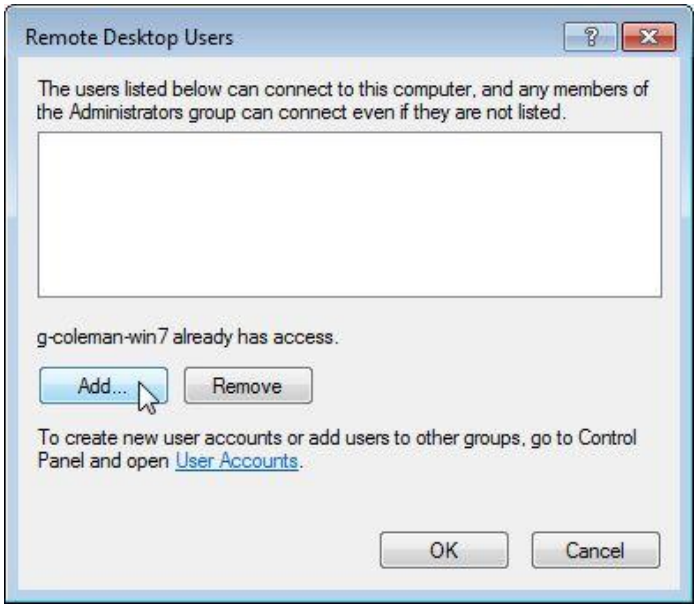
Remote desktop is disabled by default in Windows 7, therefore we will enable it.


Control Panel ▸ System and Security ▸ System
Search Control Panel
Control Panel Home
Device Manager
Remote settings
System protection
Advanced system settings
View basic information about your computer
Windows edition
Windows 7 Professional N
Copyright © 2009 Microsoft Corporation. All rights reserved.
Service Pack 1
Get more features with a new edition of Windows 7
System
Rating: System rating is not available
Processor: AMD Athlon(tm) II P320 Dual-Core Processor 2.09 GHz
Installed memory (RAM): 1.46 GB
System type: 64-bit Operating System
Pen and Touch: No Pen or Touch Input is available for this Display
Computer name, domain, and workgroup settings
Computer name: JanitorComputer
Change settings
Full computer name: JanitorComputer
Computer description:
Workgroup: G-COLEMAN
See also
Action Center
Windows Update
Performance Information and Tools
Windows activation
21 days to activate. Activate Windows now
Product ID: 00376-002-0486003-06015
Change product key

From the start menu we click on "control panel" within which we click on "system and security" followed by "system" followed by "remote settings".


System Properties
Computer Name
Hardware
Advanced
System Protection
Remote
Remote Assistance
Allow Remote Assistance connections to this computer
What happens when I enable Remote Assistance?
Advanced...
Remote Desktop
Click an option, and then specify who can connect, if needed.
Don't allow connections to this computer
Allow connections from computers running any version of Remote Desktop (less secure)
Allow connections only from computers running Remote Desktop with Network Level Authentication (more secure)
Help me choose
Select Users...
OK
Cancel
Apply

We then tick the box to "allow remote assistance connections to this computer", and select the radio box to "allow connections only from computers running remote desktop with network level authentication", following which we click on "select users".

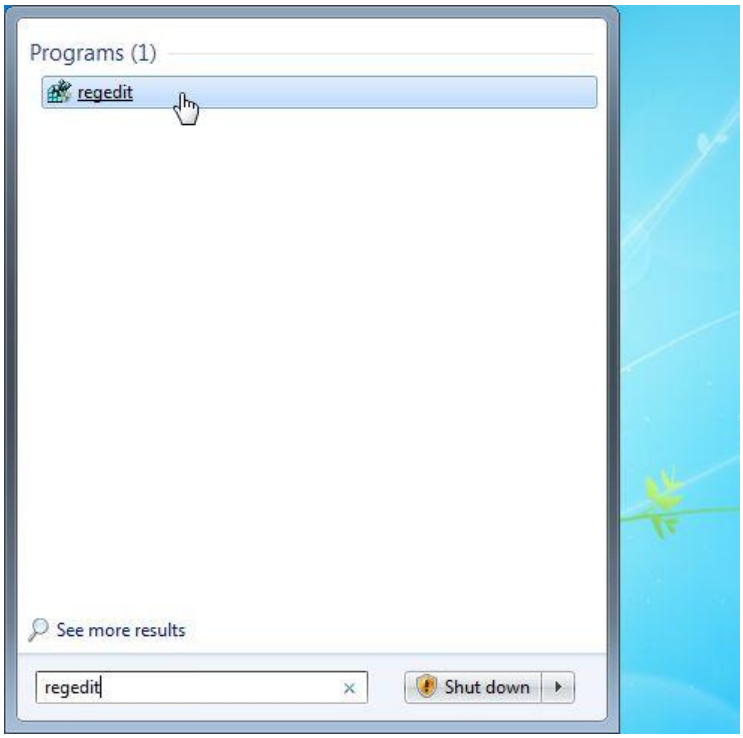

Remote Desktop Users
The users listed below can connect to this computer, and any members of the Administrators group can connect even if they are not listed.
g-coleman-win7 already has access.
Add...
Remove
To create new user accounts or add users to other groups, go to Control Panel and open User Accounts.
OK
Cancel

This opens the "remote desktop users" dialog box which allows us to set which users can access the computer remotely. The administrators group have remote desktop access by default.

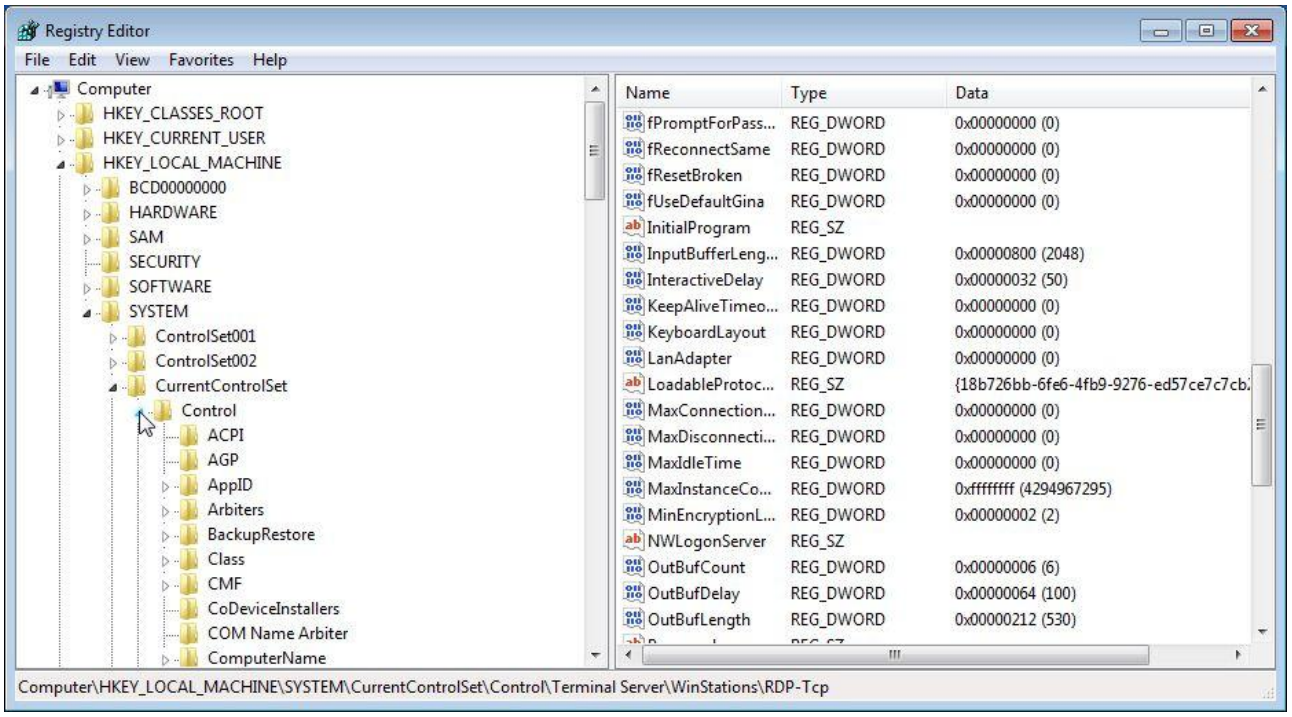
---

### A.4.2 - Changing the Default Port for Remote Desktop

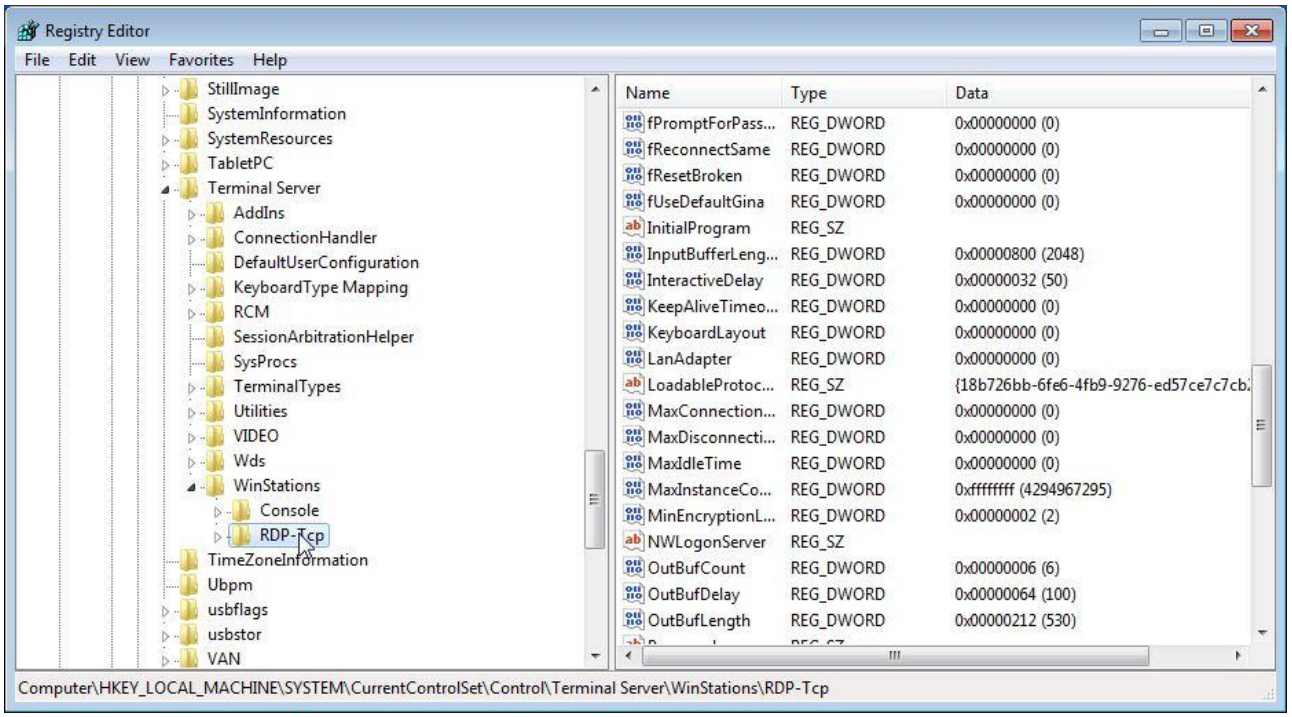
To improve security we will change the default port for remote desktop as this is a potential point of attack for a security breach.



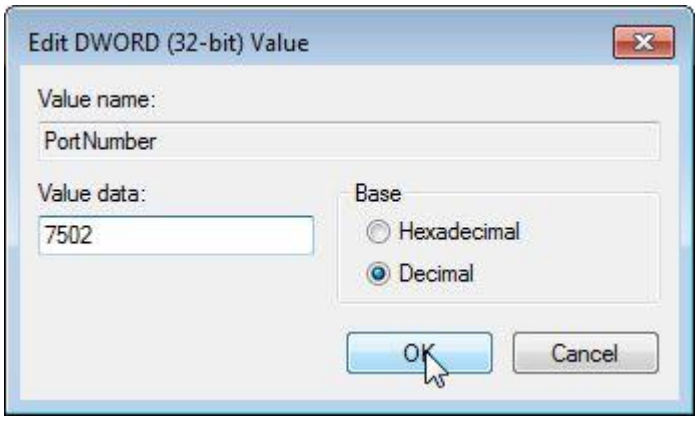

Port assignations are listed within the system registry, to access which we enter "regedit" in the search bar of the start menu, and then we open the registry editor.



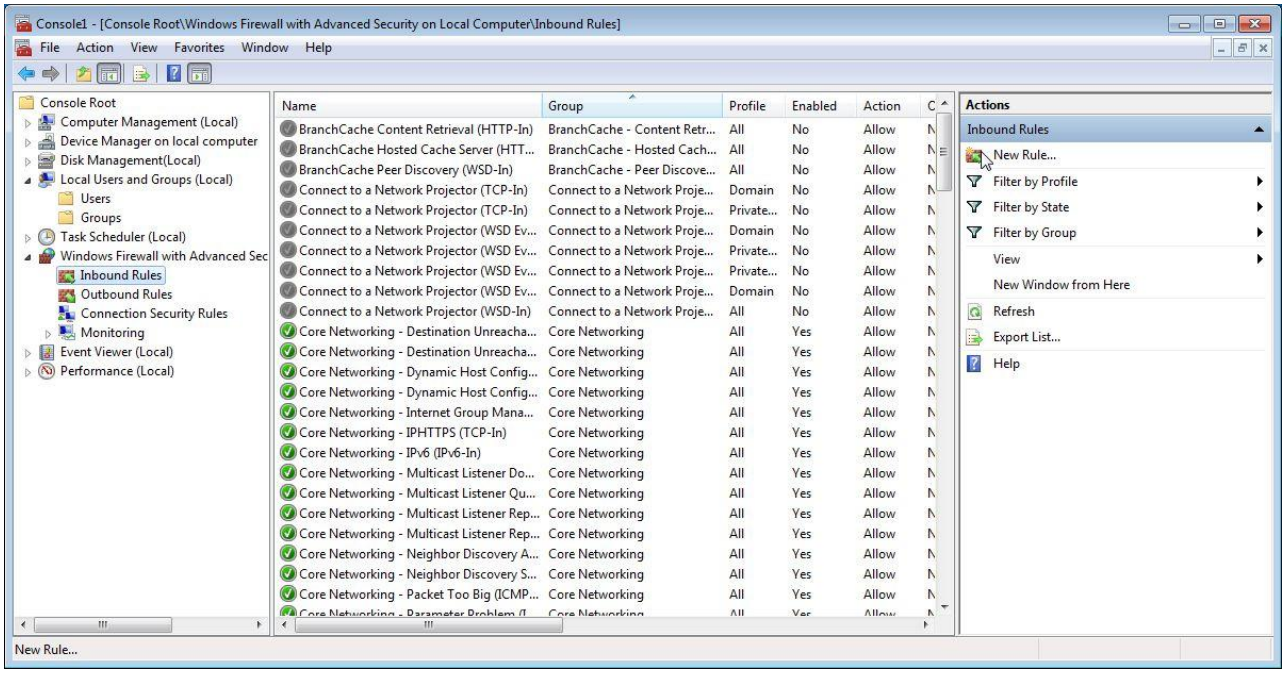

Within the registry editor we expand the "HKEY_LOCAL-MACHINE" key, followed by the "SYSTEM" folder, followed by the "current control set" folder, followed by the "control" folder.



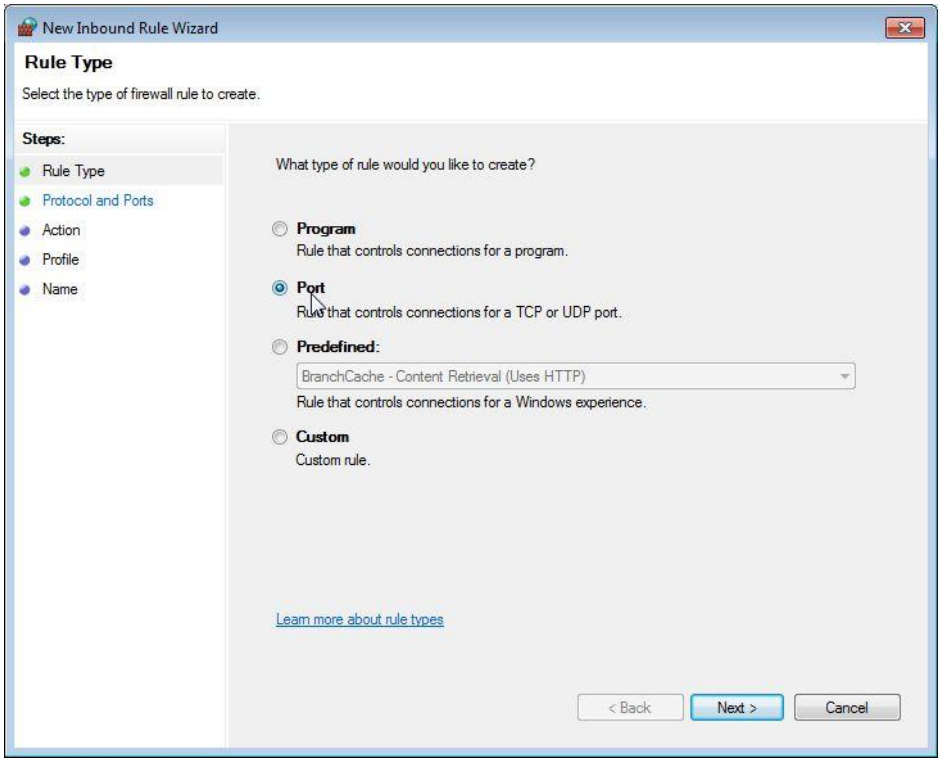

From the "control" folder we expand the "Terminal Server" folder, followed by the "WinStations" folder, from where we open the "RDP-Tcp" folder. Within this folder we open the "PortNumber" file.



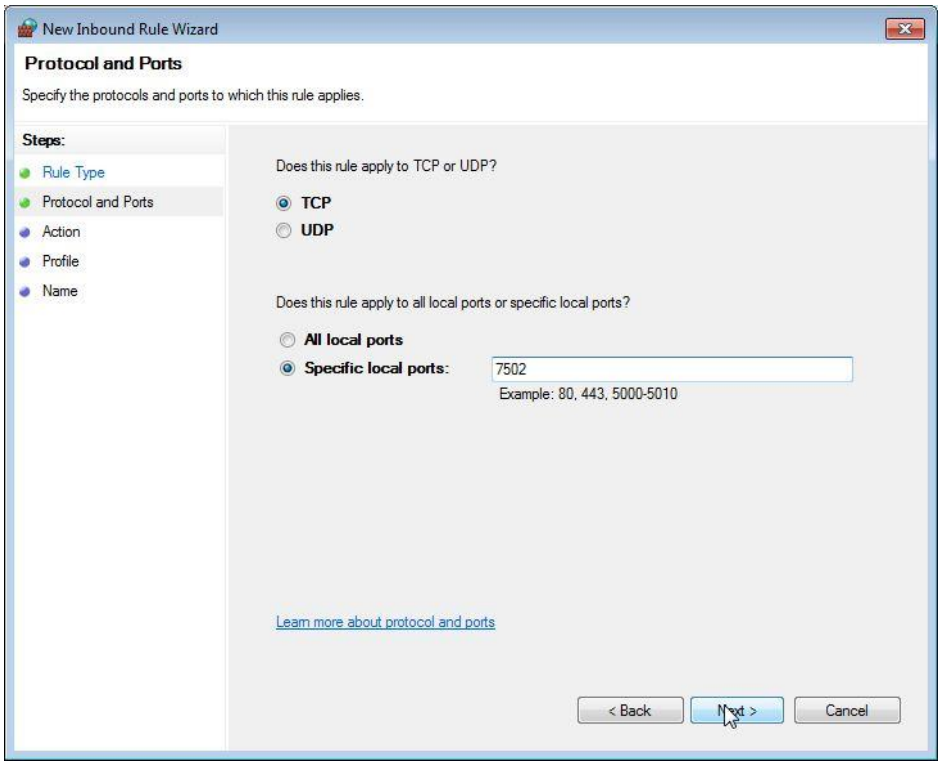

This opens the port number dialog, from where we can change the port number from the default number of 3389 to a non-default value. We will select 7502. We must select a number greater than 1024 as the first 1024 ports are either used or reserved.



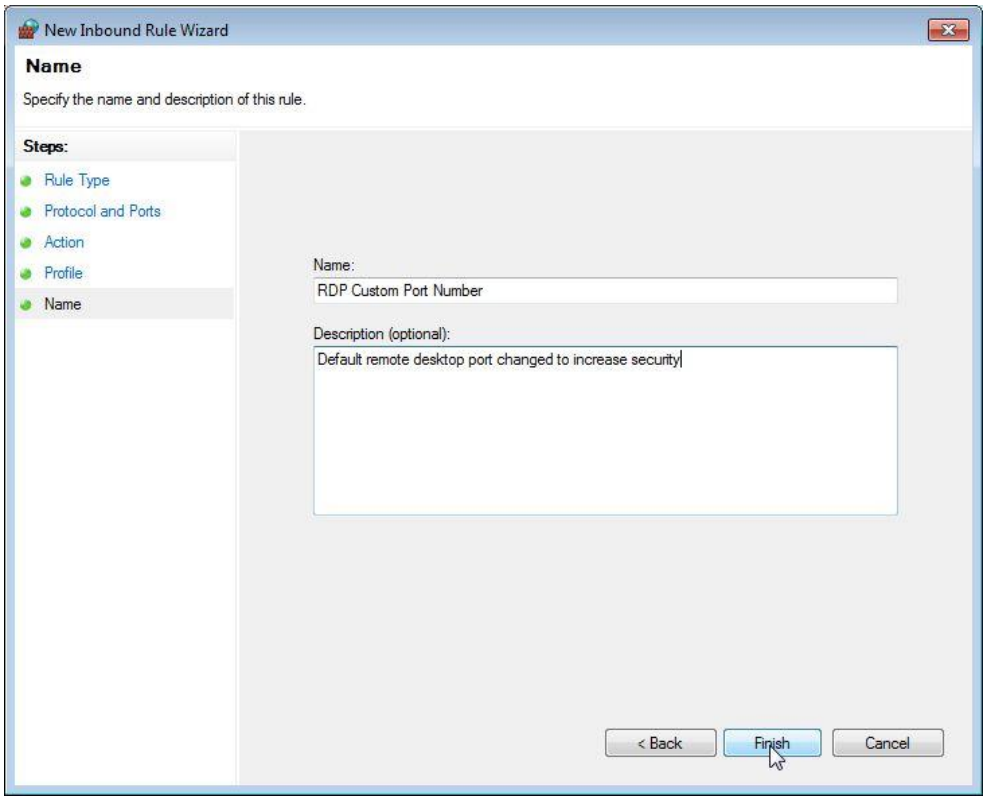

It is now necessary for the operating system to know which port to use for remote desktop connections, therefore from the microsoft management console we open "windows firewall with advanced security" followed by "inbound rules". From here we click on "new rule".




This opens the "new inbound rule" wizard where we select "port" to create a rule that controls connections for a TCP or UDP port.




We then select "TCP" and enter the new port number for remote desktop connections into the "specific local ports" field, and click "next".



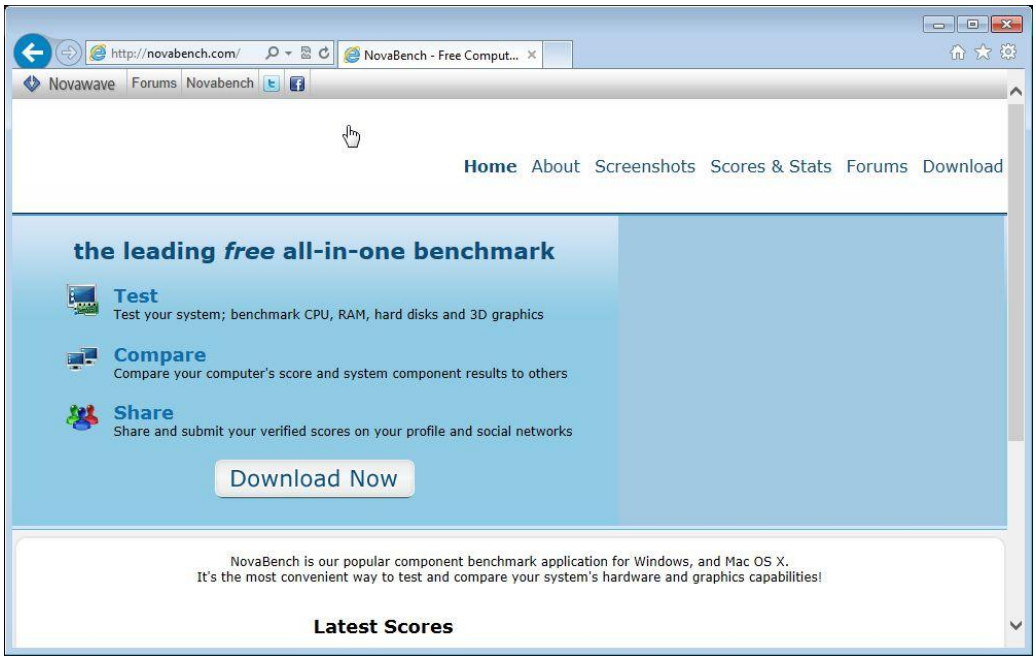

We then give the new rule a name, in this case we will call it RDP Custom Port Number and a description, after which we click "finish" to complete the wizard.

The process is repeated as a new "Outbound Rule", after which the newly assigned port is now configured to connect with a remote desktop connection.

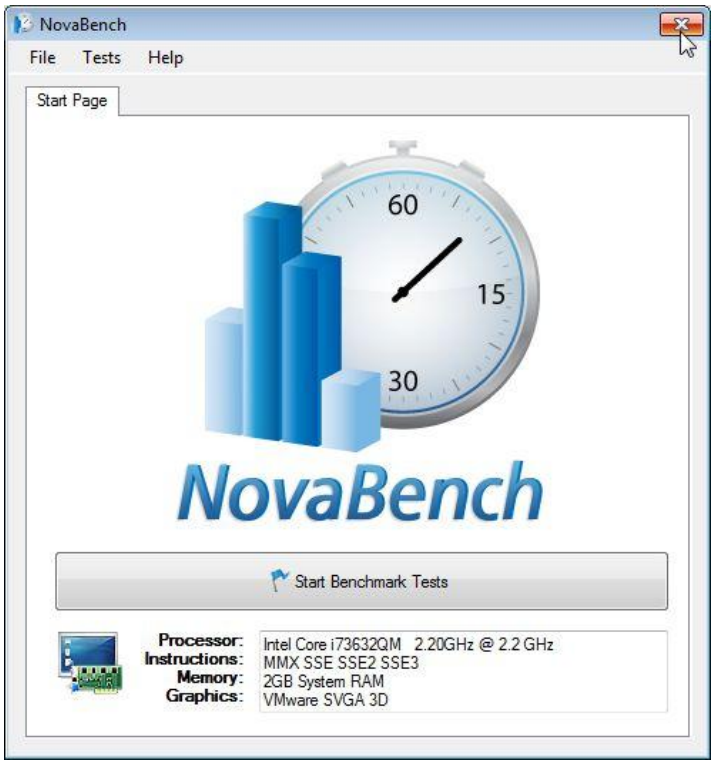
---

## Task A.5 - Performance

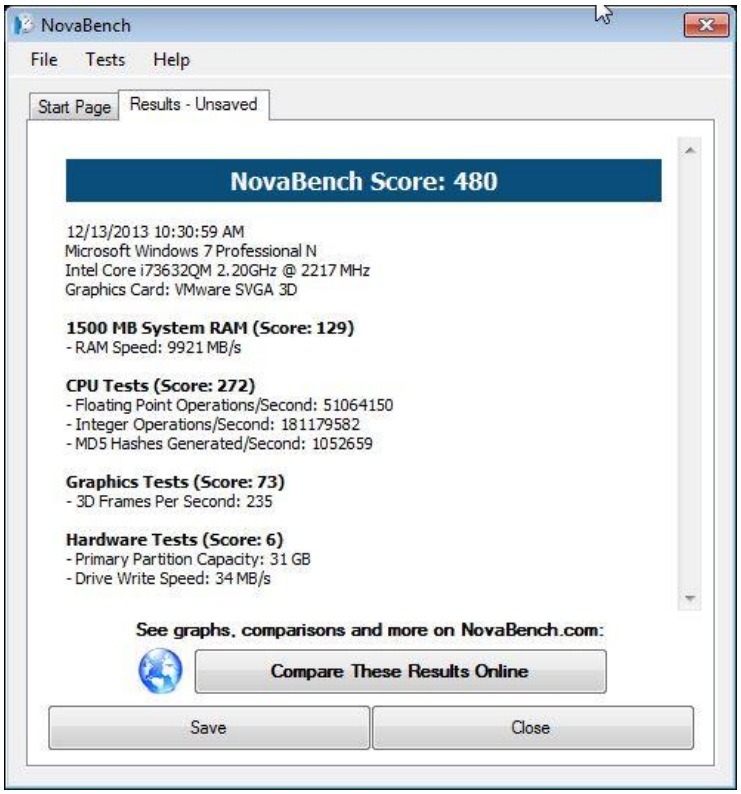
### A.5.1 - Use Swap File to Increase Performance of the Machine


http://novabench.com/
NovaBench - Free Comput...
Novawave
Forums
Novabench
Home
About
Screenshots
Scores & Stats
Forums
Download
the leading free all-in-one benchmark
Test
Test your system; benchmark CPU, RAM, hard disks and 3D graphics
Compare
Compare your computer's score and system component results to others
Share
Share and submit your verified scores on your profile and social networks
Download Now
NovaBench is our popular component benchmark application for Windows, and Mac OS X.
It's the most convenient way to test and compare your system's hardware and graphics capabilities!
Latest Scores

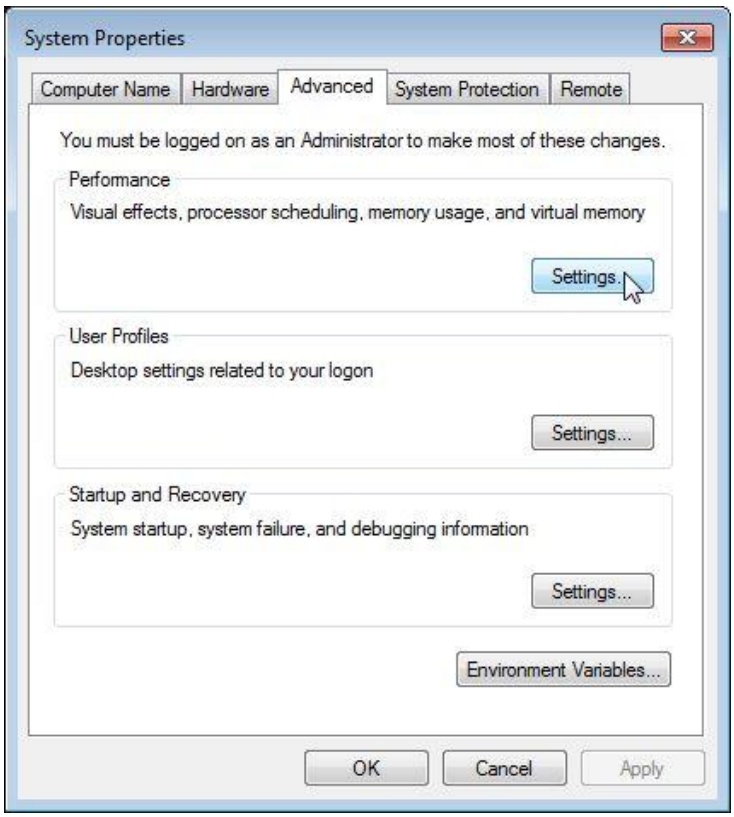
We will now use the configuration of the swap file to improve the performance of the machine, and use a benchmarking tool to document the results. Therefore it is necessary to install a benchmarking tool in order to have a benchmark to compare the performance with following changes to the configuration. We will use Novabench, a free application to do this.
Using the web browser we navigate to www.novabench.com, and click on "download now", and select the windows download.



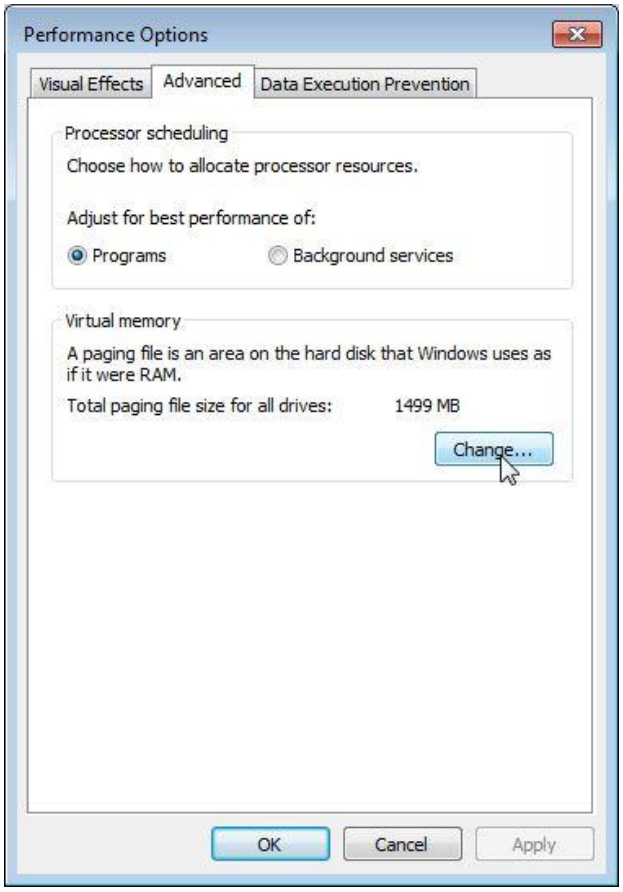

Once the utility has installed we click on "start benchmark test", once all open programs have been closed.


NovaBench
File Tests Help
Start Page Results - Unsaved
NovaBench Score: 480
12/13/2013 10:30:59 AM
Microsoft Windows 7 Professional N
Intel Core i73632QM 2.20GHz @ 2217 MHz
Graphics Card: VMware SVGA 3D
1500 MB System RAM (Score: 129)
- RAM Speed: 9921 MB/s
CPU Tests (Score: 272)
- Floating Point Operations/Second: 51064150
- Integer Operations/Second: 181179582
- MD5 Hashes Generated/Second: 1052659
Graphics Tests (Score: 73)
- 3D Frames Per Second: 235
Hardware Tests (Score: 6)
- Primary Partition Capacity: 31 GB
- Drive Write Speed: 34 MB/s
See graphs, comparisons and more on NovaBench.com:
Compare These Results Online
Save
Close

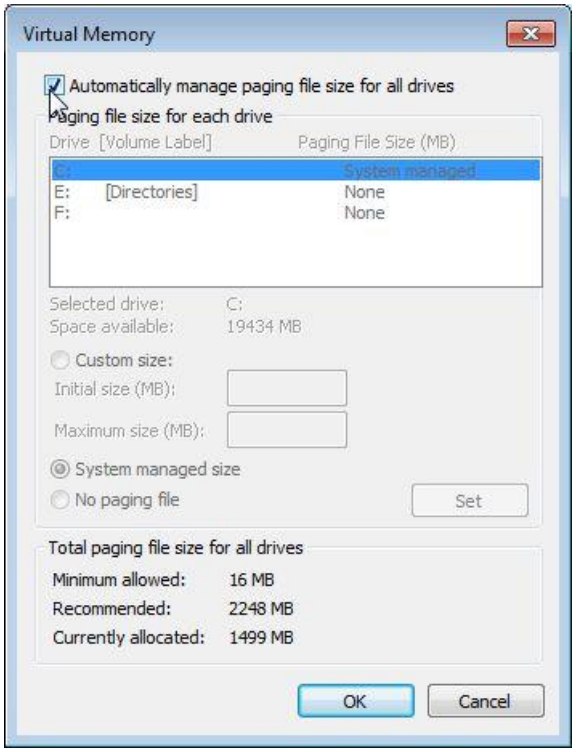
The benchmarking tool carries out a series of tests on the system, and produces a score, in our case, of 480. This will be our benchmark to compare the system performance once we have made changes to the swap file.



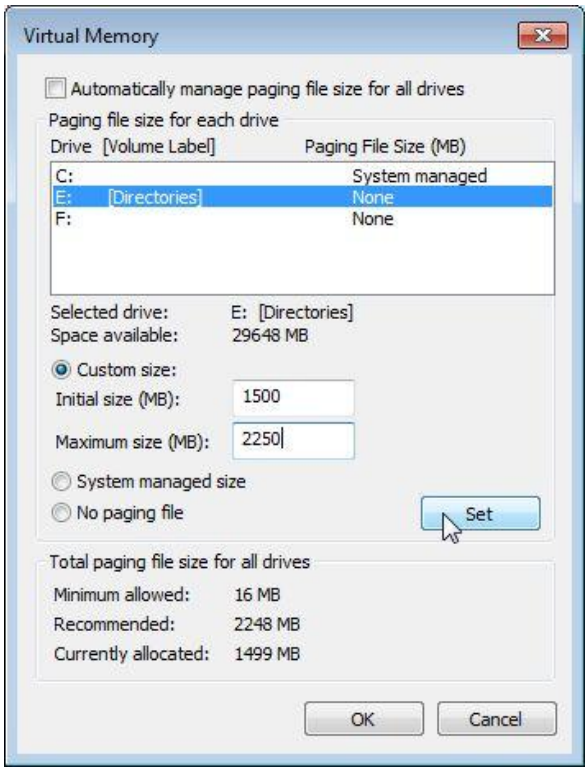

To access the swap file settings from the "start" menu we click on "control panel" followed by "system and security" followed by "system" followed by "advanced system settings" followed by the "settings" button within the "performance" section.



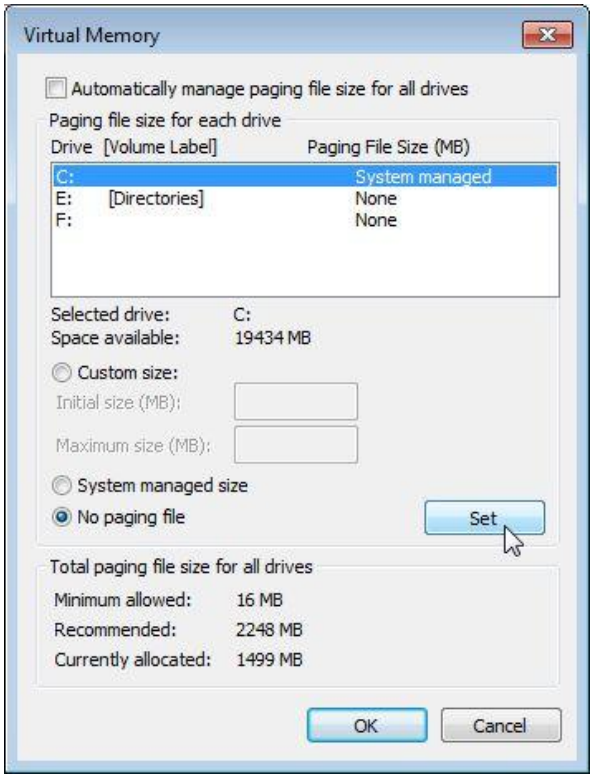

Within the "advanced" tab of the resultant dialog box, under the "virtual memory" section we click on the "change" button.



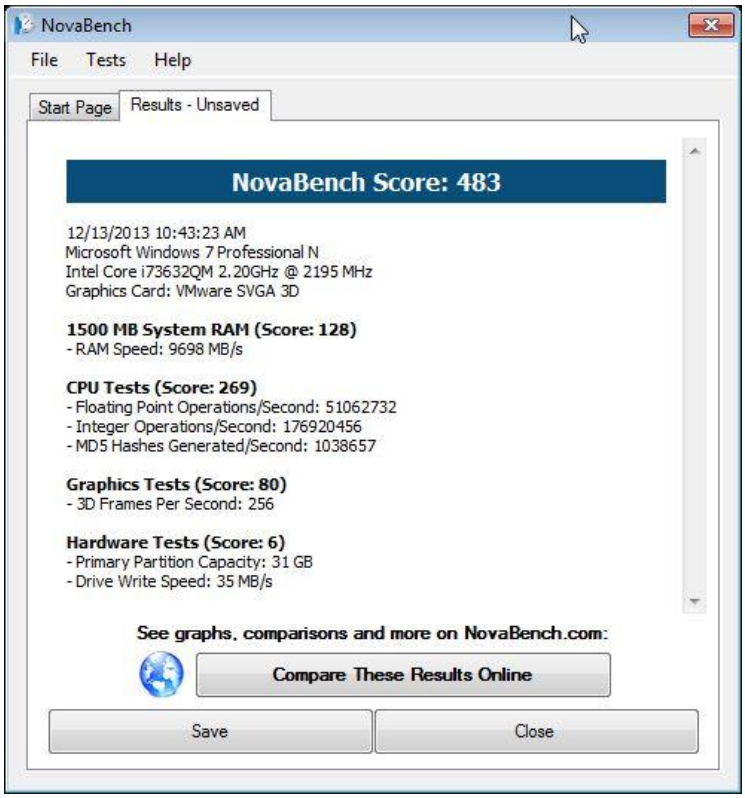

We firstly untick the "automatically manage paging file sizes for all drives".




We can then add a paging file to our second partition by highlighting this partition, and then and set the size of this paging file by clicking on "custom size" (the recommended size is 1.5 times the size of the system RAM) so we change the maximum size to 2250MB).




Upon installation, windows locates the paging (swap) file on the boot partition. However as we now have a paging file on our secondary partition, we can create a performance boost by removing the paging file from the boot partition, by clicking on the primary partition and then selecting "no paging file".



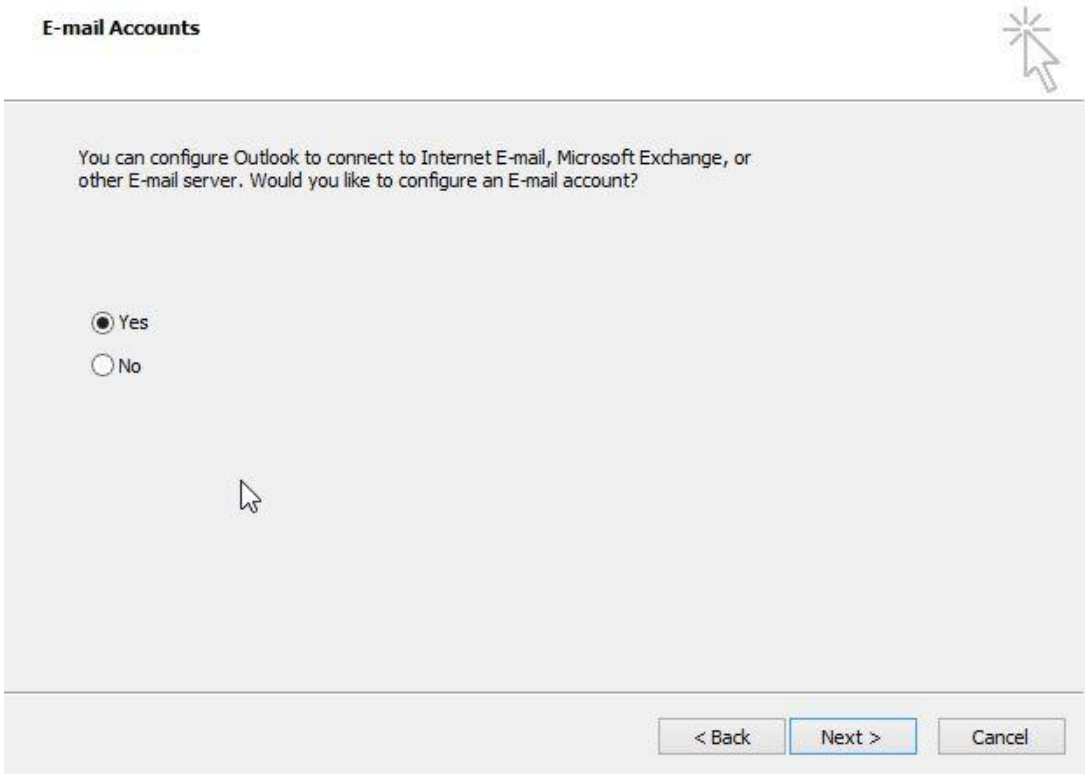

We then run our benchmarking tool again, and we see that there has been an performance gain, with the score rising from 480 to 483.

An alternative method to secure a significant improvement in performance would be to install a solid state drive in a computer, and locate the swap file on it.

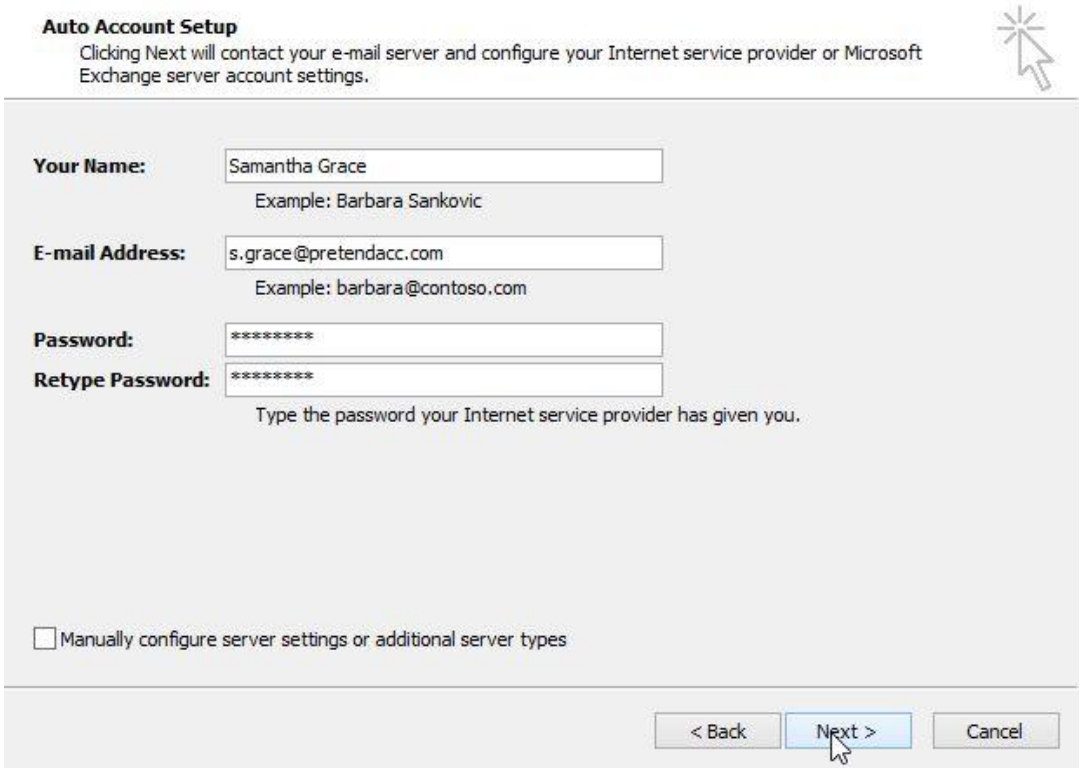
---

## Task A.6 - Email Accounts

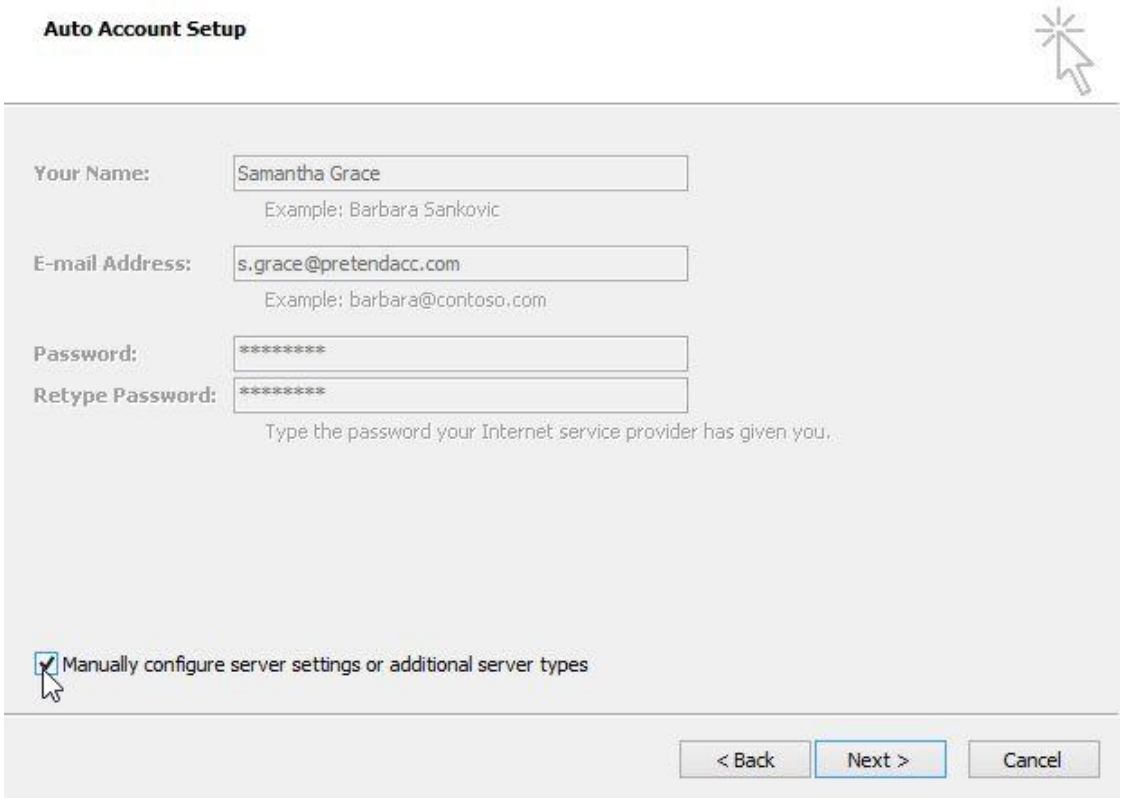
### A.6.1 - Setting up an Email Account for a User

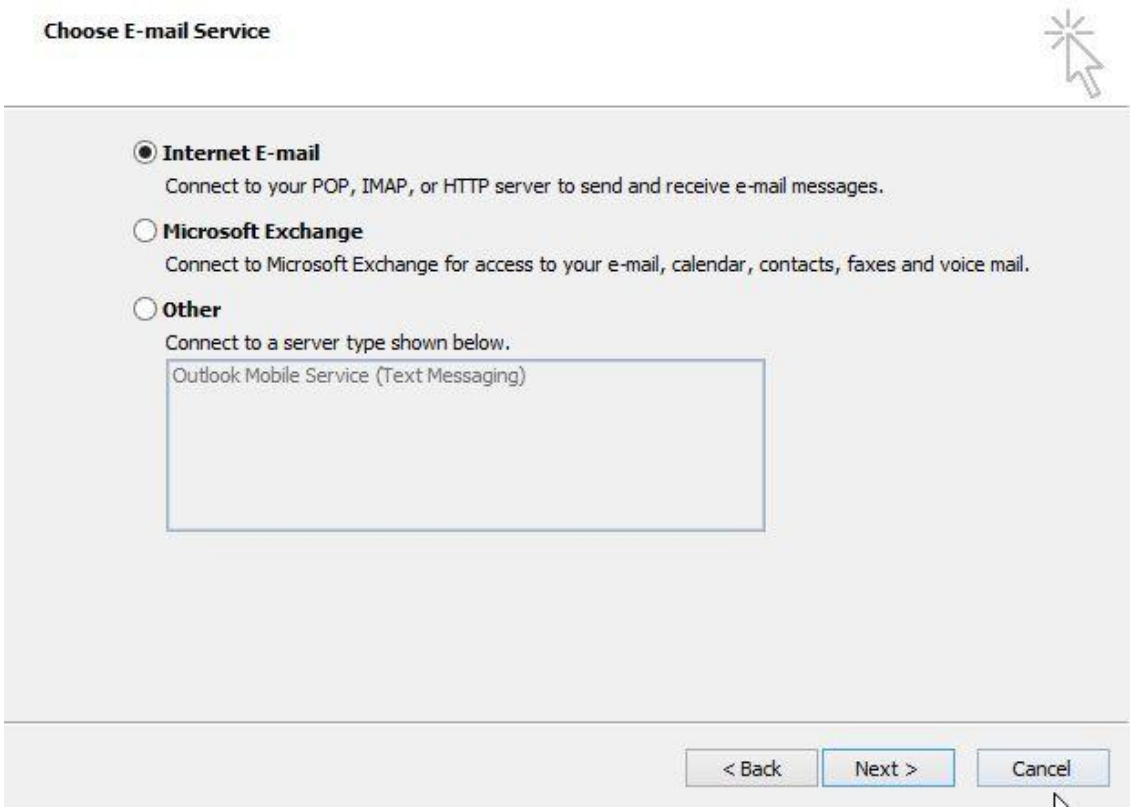

E-mail Accounts
You can configure Outlook to connect to Internet E-mail, Microsoft Exchange, or other E-mail server. Would you like to configure an E-mail account?
Yes
No
< Back
Next >
Cancel

From the "start" menu we select "all programs" followed by "outlook express" and select "yes" on the resultant dialog asking if we wish to configure an email account.

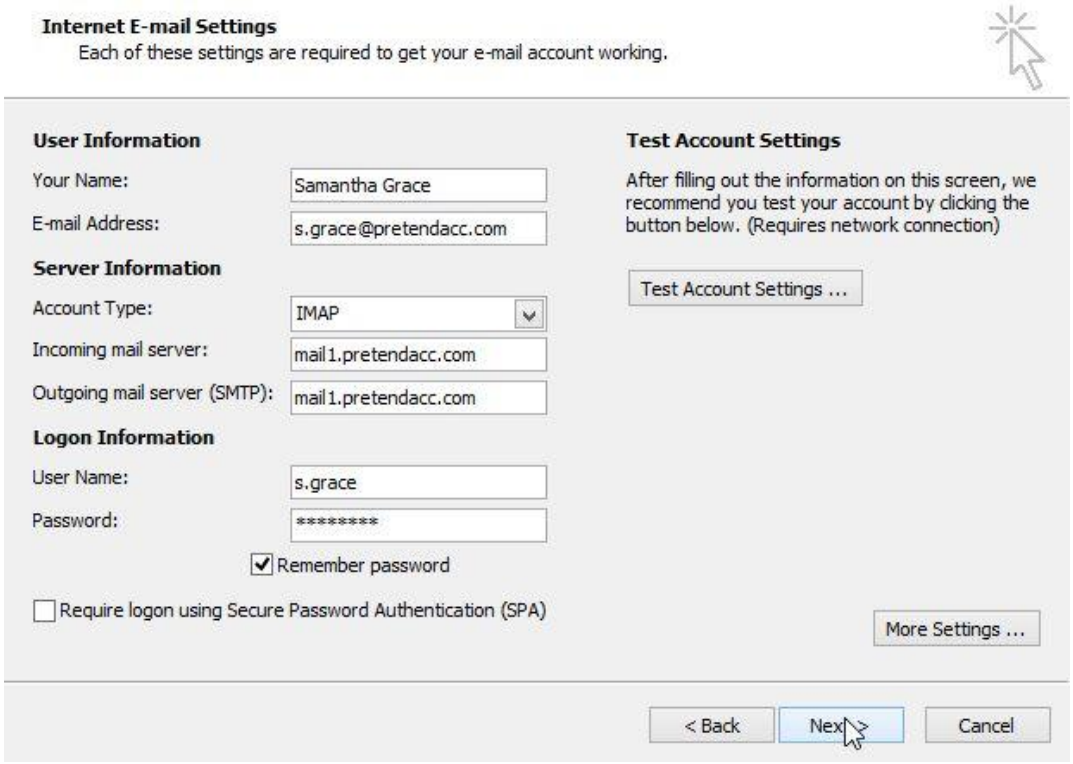

Auto Account Setup
Clicking Next will contact your e-mail server and configure your Internet service provider or Microsoft Exchange server account settings.
Your Name:
Samantha Grace
Example: Barbara Sankovic
E-mail Address:
s.grace@pretendacc.com
Example: barbara@contoso.com
Password:
Retype Password:
Type the password your Internet service provider has given you.
Manually configure server settings or additional server types
< Back
Next >
Cancel

We then enter the name Samantha Grace and the email address s.grace@pretendacc.com as specified, and enter a password for the user's email account, and having clicked to manually configure server settings, we click "next" to continue the wizard.

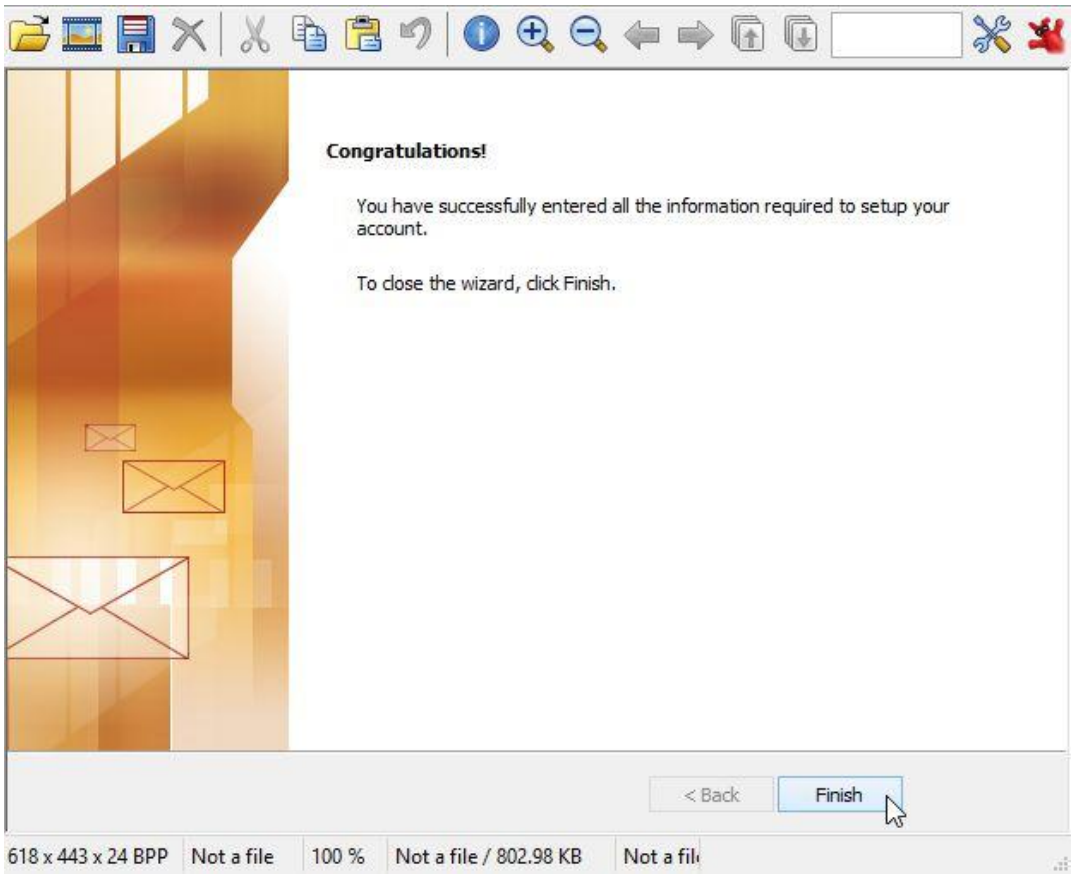




Choose E-mail Service
Internet E-mail
Connect to your POP, IMAP, or HTTP server to send and receive e-mail messages.
Microsoft Exchange
Connect to Microsoft Exchange for access to your e-mail, calendar, contacts, faxes and voice mail.
Other
Connect to a server type shown below.
Outlook Mobile Service (Text Messaging)
< Back
Next >
Cancel

We then select "internet email" and click "next".



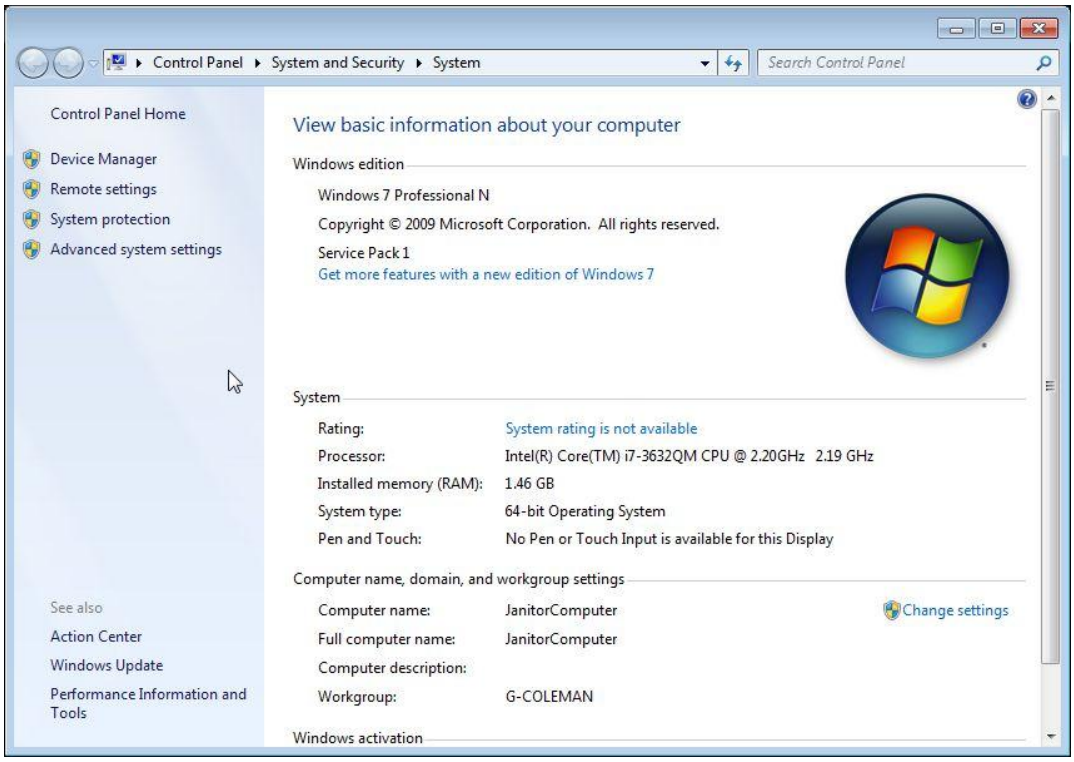

We are then brought to a screen where we select IMAP as our incoming mail server type, and define mail1.pretendacc.com as our incoming and outgoing mail server, and again we click "next"


Congratulations!
You have successfully entered all the information required to setup your account.
To close the wizard, click Finish.
< Back
Finish
618 x 443 x 24 BPP
Not a file
100 %
Not a file / 802.98 KB
Not a fil

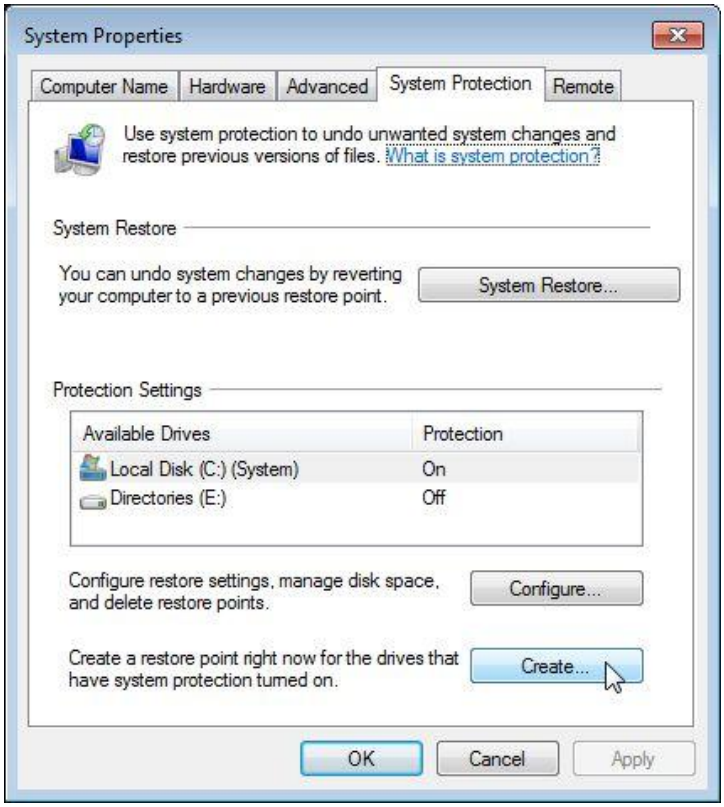
We then receive a message that the information has been correctly entered, and we click "finish" to complete the wizard.

## Task A.7 - System Restore Setup and Testing

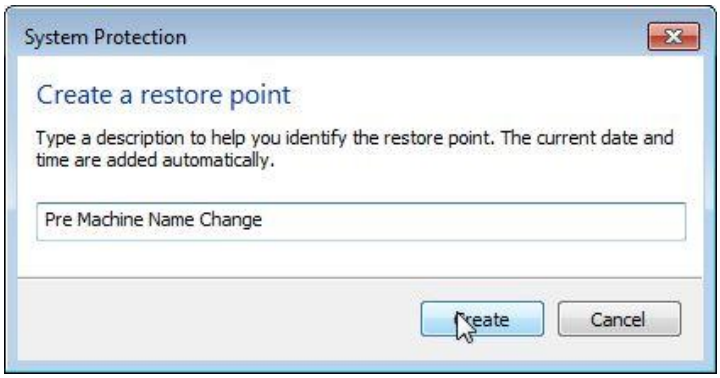
### A.7.1 - Creating a System Restore Point


Control Panel ▸ System and Security ▸ System
Search Control Panel
Control Panel Home
Device Manager
Remote settings
System protection
Advanced system settings
View basic information about your computer
Windows edition
Windows 7 Professional N
Copyright © 2009 Microsoft Corporation. All rights reserved.
Service Pack 1
Get more features with a new edition of Windows 7
System
Rating: System rating is not available
Processor: Intel(R) Core(TM) i7-3632QM CPU @ 2.20GHz 2.19 GHz
Installed memory (RAM): 1.46 GB
System type: 64-bit Operating System
Pen and Touch: No Pen or Touch Input is available for this Display
Computer name, domain, and workgroup settings
Computer name: JanitorComputer
Change settings
Full computer name: JanitorComputer
Computer description:
Workgroup: G-COLEMAN
Windows activation
See also
Action Center
Windows Update
Performance Information and Tools

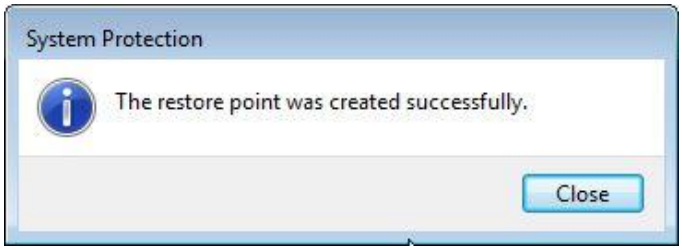
From the "start" menu we right click on "computer" and select "properties", and in the "system" dialog box we click on "system protection" in the left column.




Under the "system protection" tab we click "create" to create a restore point.


System Protection
Create a restore point
Type a description to help you identify the restore point. The current date and time are added automatically.
Pre Machine Name Change
Create
Cancel

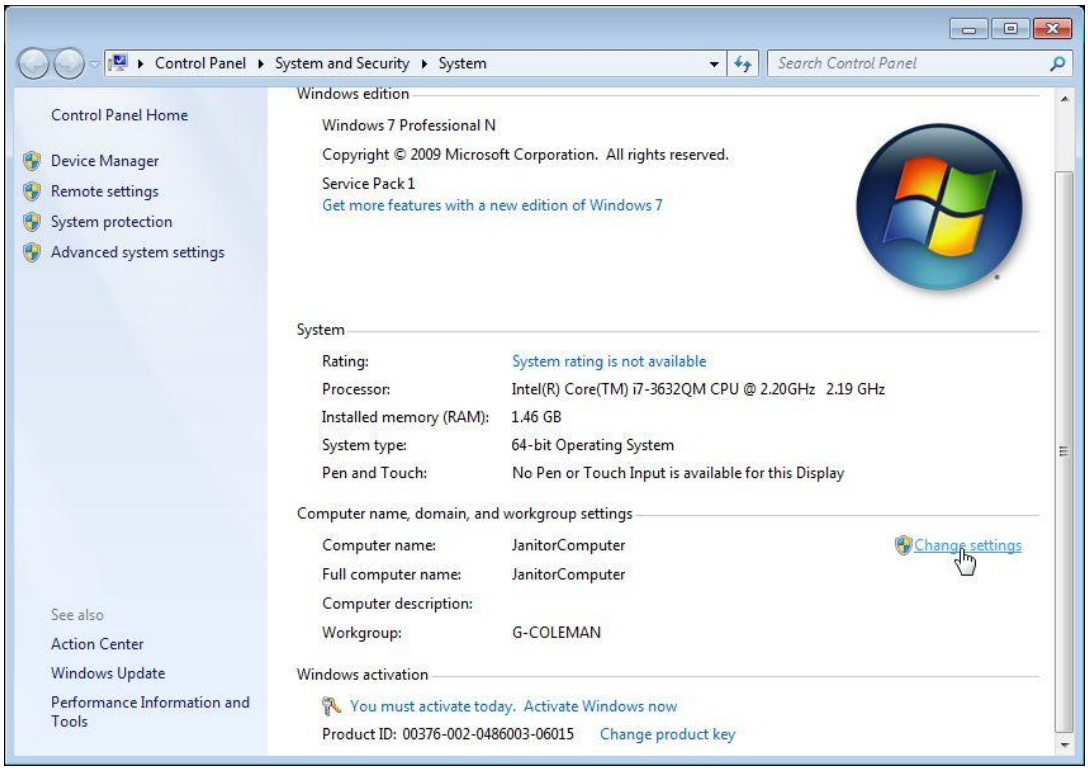
We are then prompted to type a description for the restore point, following which we click "create".



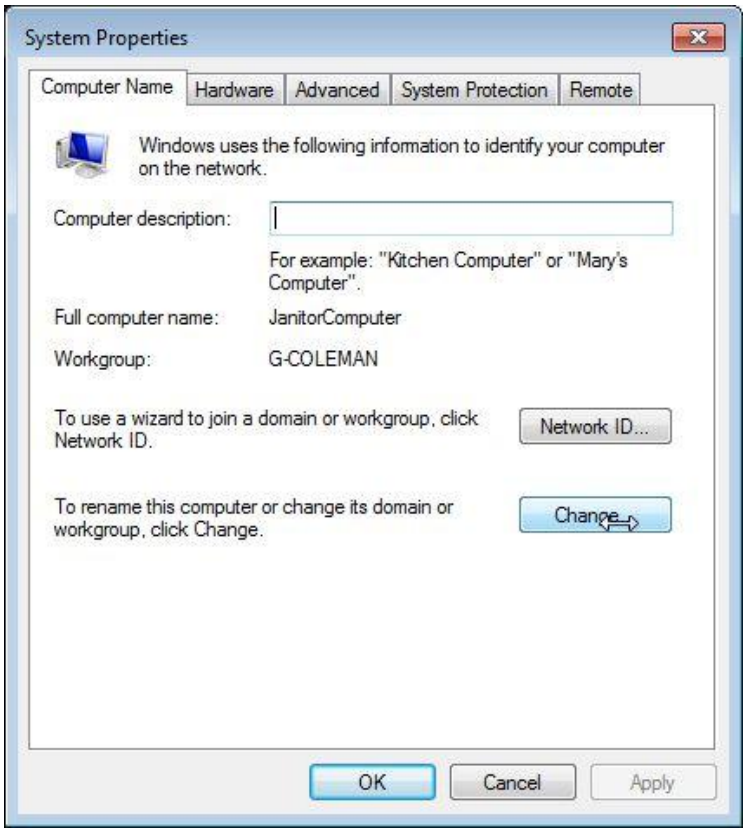

We then receive confirmation that the restore point has been created, and we click "close".

---

### A.7.2 - System Configuration Changes and Creation of New Folders

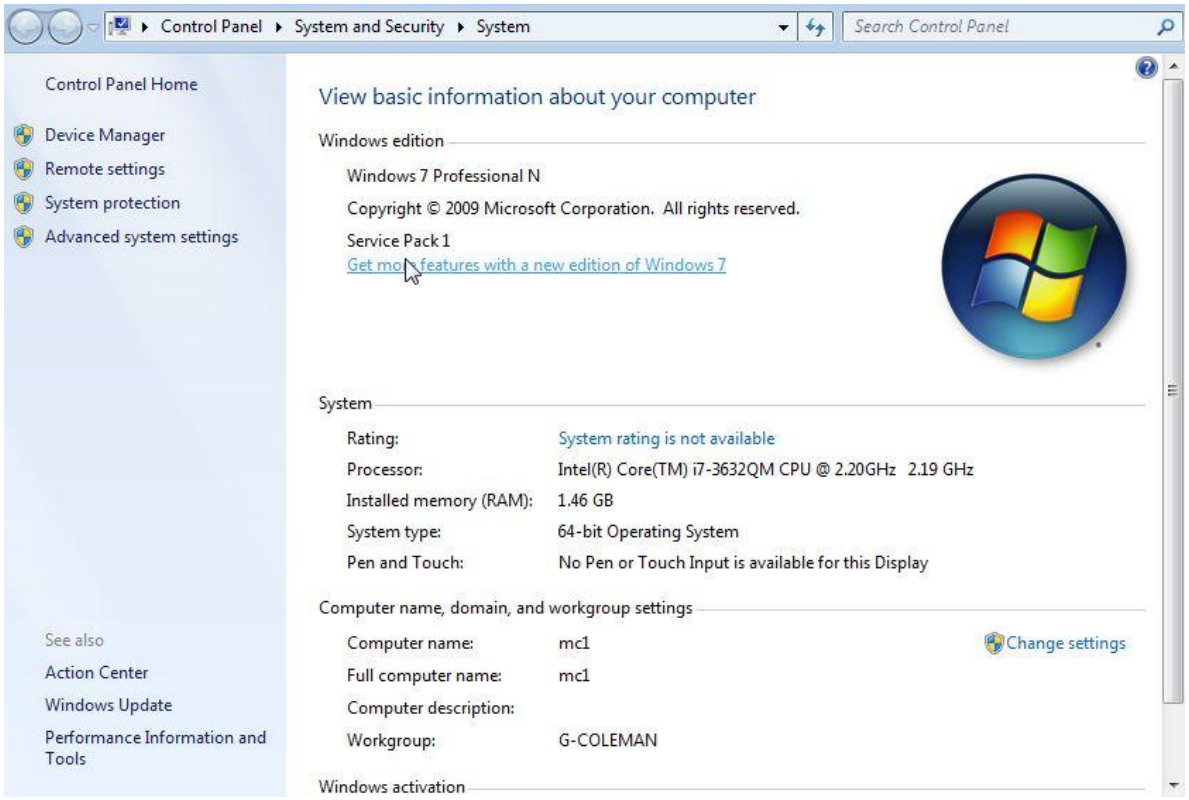

Control Panel ▸ System and Security ▸ System
Search Control Panel
Control Panel Home
Device Manager
Remote settings
System protection
Advanced system settings
Windows edition
Windows 7 Professional N
Copyright © 2009 Microsoft Corporation. All rights reserved.
Service Pack 1
Get more features with a new edition of Windows 7
System
Rating: System rating is not available
Processor: Intel(R) Core(TM) i7-3632QM CPU @ 2.20GHz 2.19 GHz
Installed memory (RAM): 1.46 GB
System type: 64-bit Operating System
Pen and Touch: No Pen or Touch Input is available for this Display
Computer name, domain, and workgroup settings
Computer name: JanitorComputer
Full computer name: JanitorComputer
Computer description:
Workgroup: G-COLEMAN
Change settings
See also
Action Center
Windows Update
Performance Information and Tools
Windows activation
You must activate today. Activate Windows now
Product ID: 00376-002-0486003-06015 Change product key

From the "start" menu we right click on "computer" and select "properties", and in the "system" dialog box we click on "change settings" in the "computer name" section.

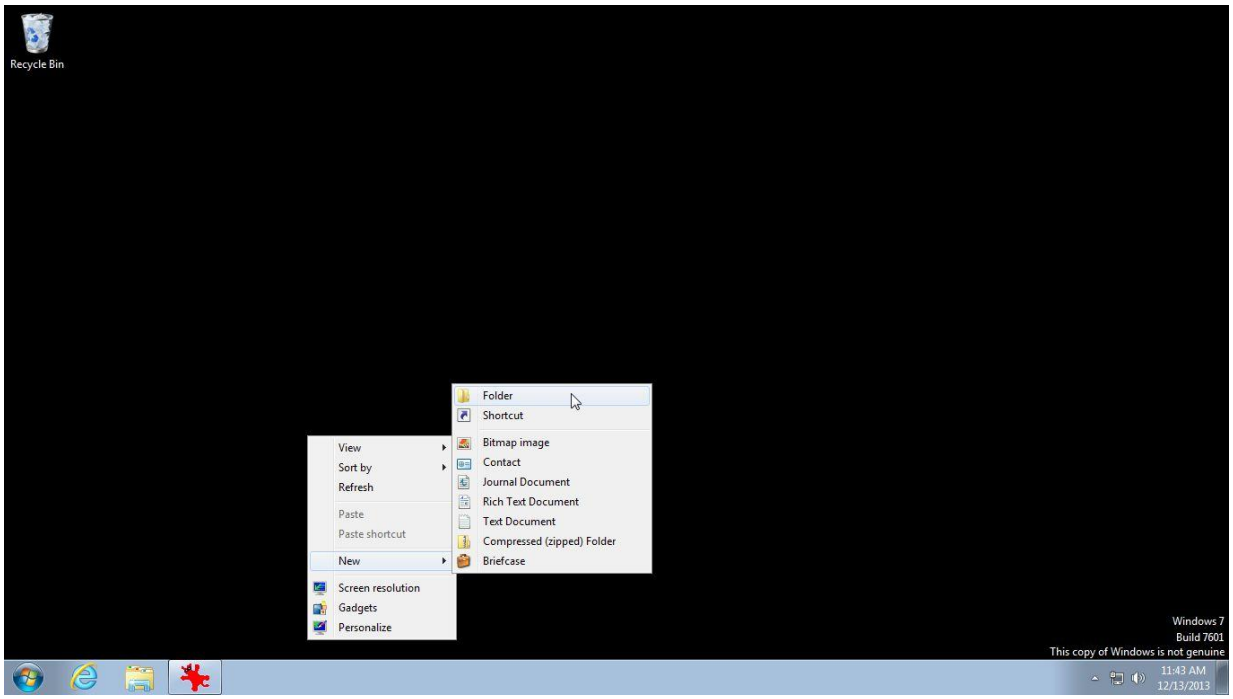



We click on "change" to rename the computer.

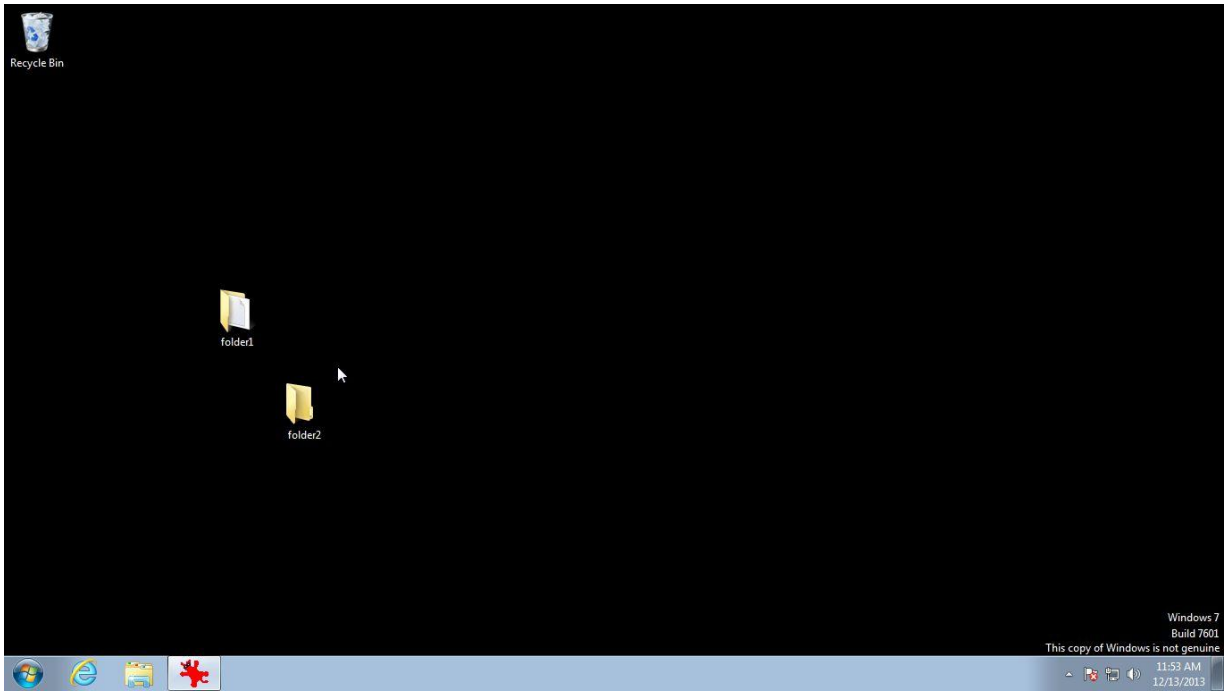
We enter the new name "mc1" as specified and click "ok".


Control Panel ▸ System and Security ▸ System
Search Control Panel
Control Panel Home
Device Manager
Remote settings
System protection
Advanced system settings
View basic information about your computer
Windows edition
Windows 7 Professional N
Copyright © 2009 Microsoft Corporation. All rights reserved.
Service Pack 1
Get more features with a new edition of Windows 7
System
Rating: System rating is not available
Processor: Intel(R) Core(TM) i7-3632QM CPU @ 2.20GHz 2.19 GHz
Installed memory (RAM): 1.46 GB
System type: 64-bit Operating System
Pen and Touch: No Pen or Touch Input is available for this Display
Computer name, domain, and workgroup settings
Computer name: mc1
Change settings
Full computer name: mc1
Computer description:
Workgroup: G-COLEMAN
Windows activation
See also
Action Center
Windows Update
Performance Information and Tools

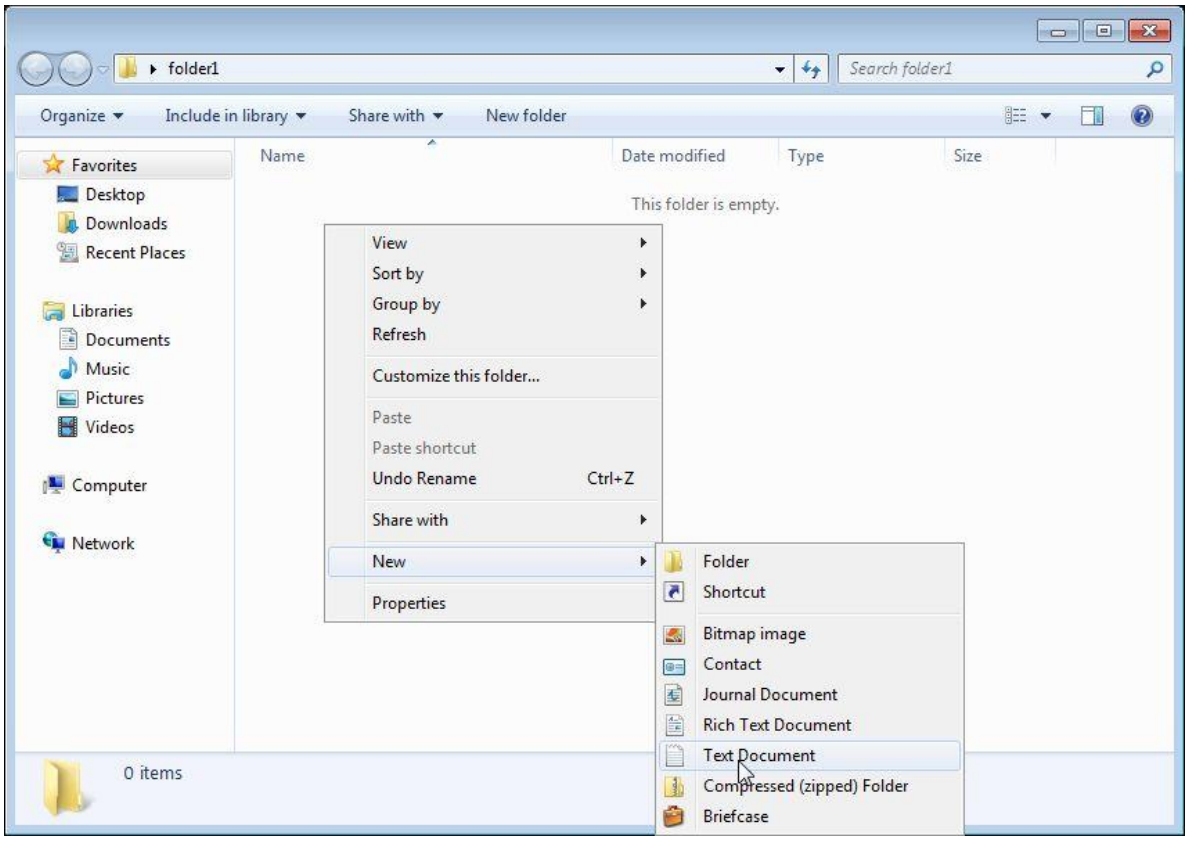
We are then prompted to restart the computer to effect the computer name change, following which, navigating to the system window again, we see that the computer name has changed to mc1.




To create new folders, we right click on the desktop and select "new" followed by "folder".

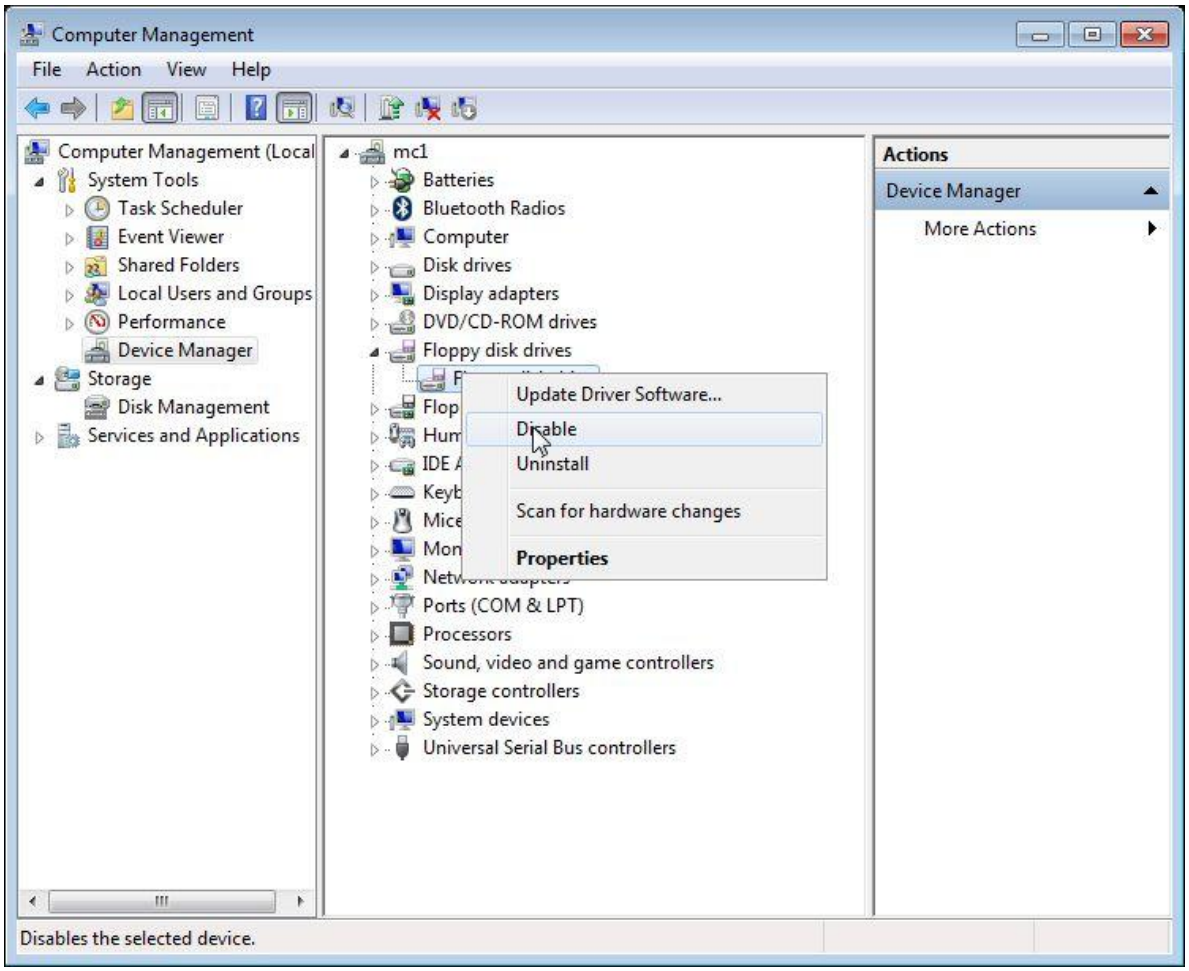



Having created two new folders, we right click on each of them and select "rename", naming them folder1 and folder2.

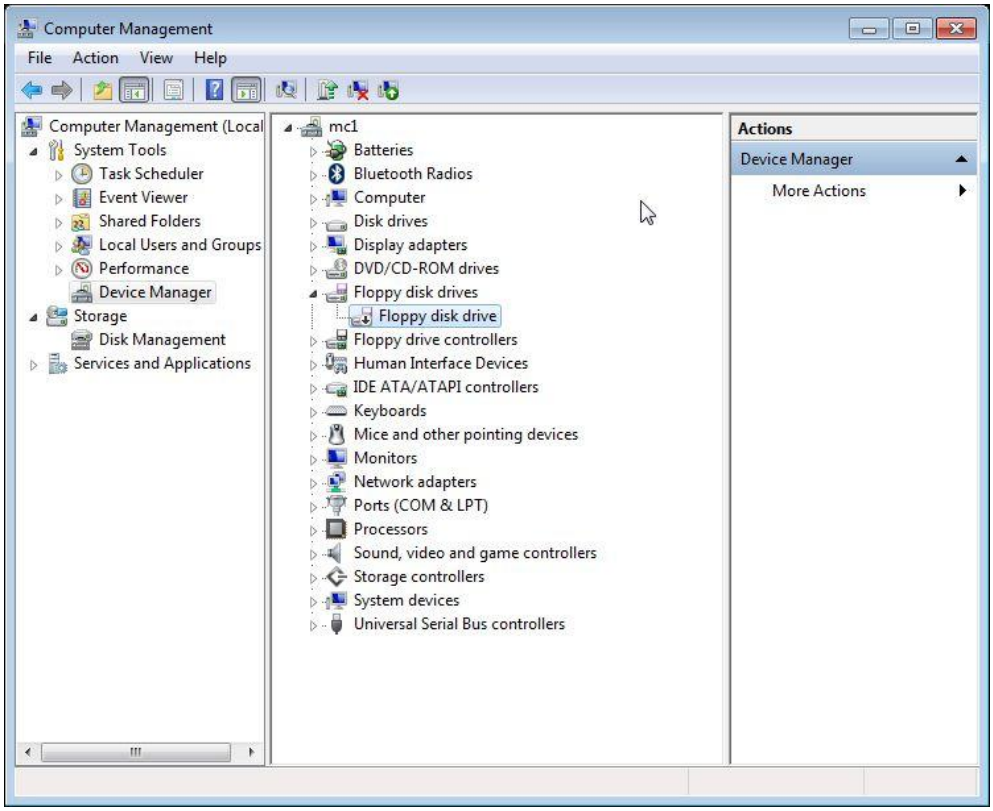



We then double click on folder1 to open it and once it open we right click within the window and click "new" followed by "text file" which we then rename as "notes".

We then open the "notes" text file and enter our name within it.




We then enter the computer management utility by right clicking on "computer" from the "start" menu and selecting "manage". Within the utility we open the device manager, and right click on "floppy disk drives" and select "disable", and "yes" to confirm.

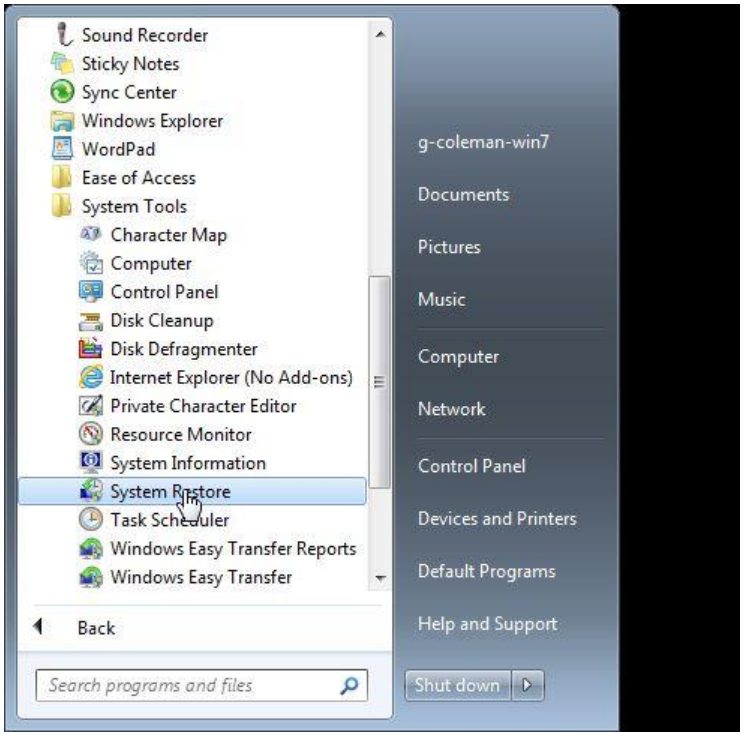



We can then see that the floppy drive has been disabled.

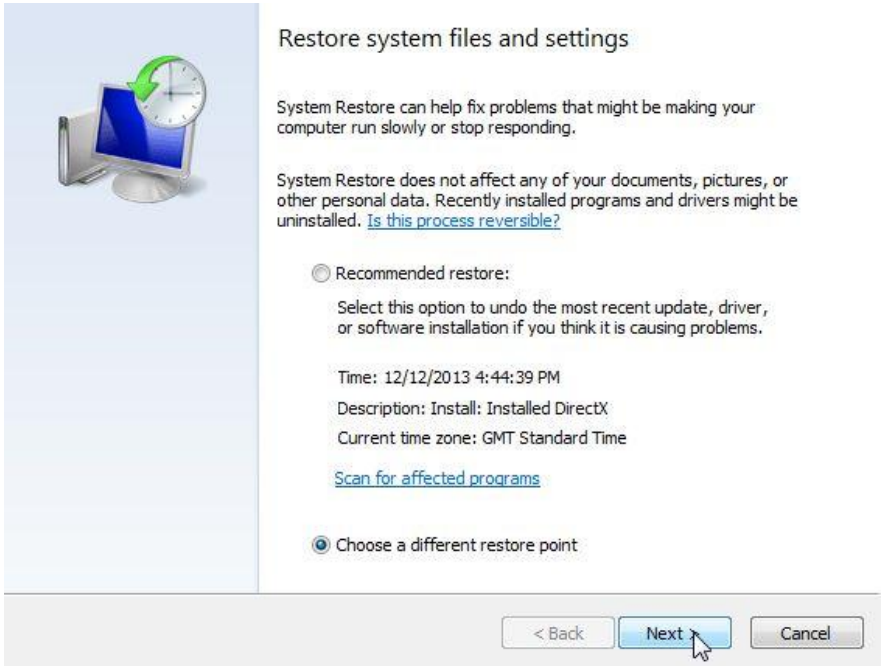
---

### A.7.3 - Restoring the PC to the Created Restore Point

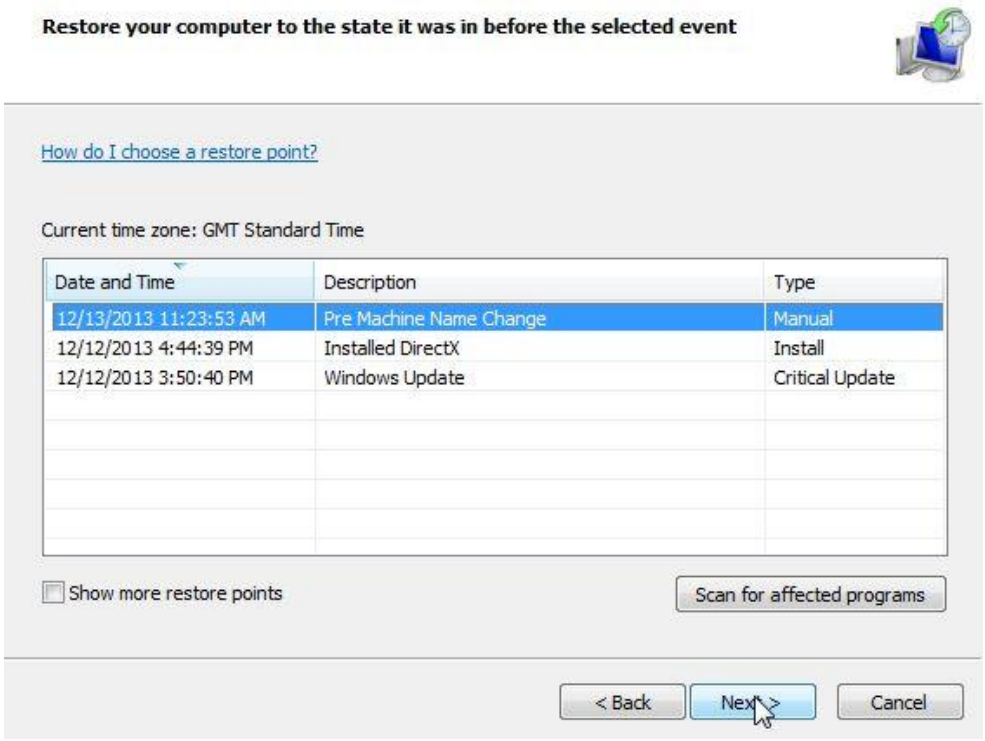
Our next step is to restore the PC to the restore point that we created earlier, so that we can discern which changes we made in the steps above are affected by the system restore utility.



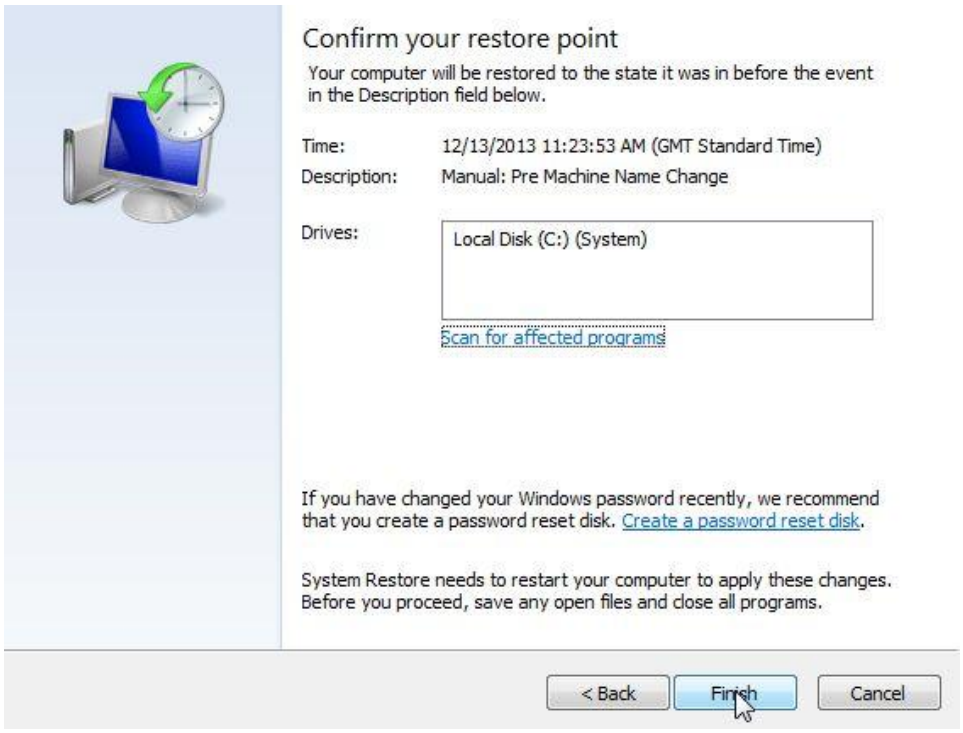

From the "start" menu we select "all programs" followed by "accessories", and within "system tools" we click on "system restore".


Restore system files and settings
System Restore can help fix problems that might be making your computer run slowly or stop responding.
System Restore does not affect any of your documents, pictures, or other personal data. Recently installed programs and drivers might be uninstalled. Is this process reversible?
Recommended restore:
Select this option to undo the most recent update, driver, or software installation if you think it is causing problems.
Time: 12/12/2013 4:44:39 PM
Description: Install: Installed DirectX
Current time zone: GMT Standard Time
Scan for affected programs
Choose a different restore point
< Back
Next >
Cancel

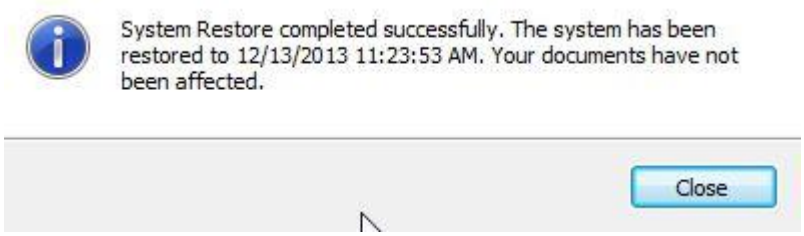
In the system restore dialog box we select "chose a different restore point" and then click "next".



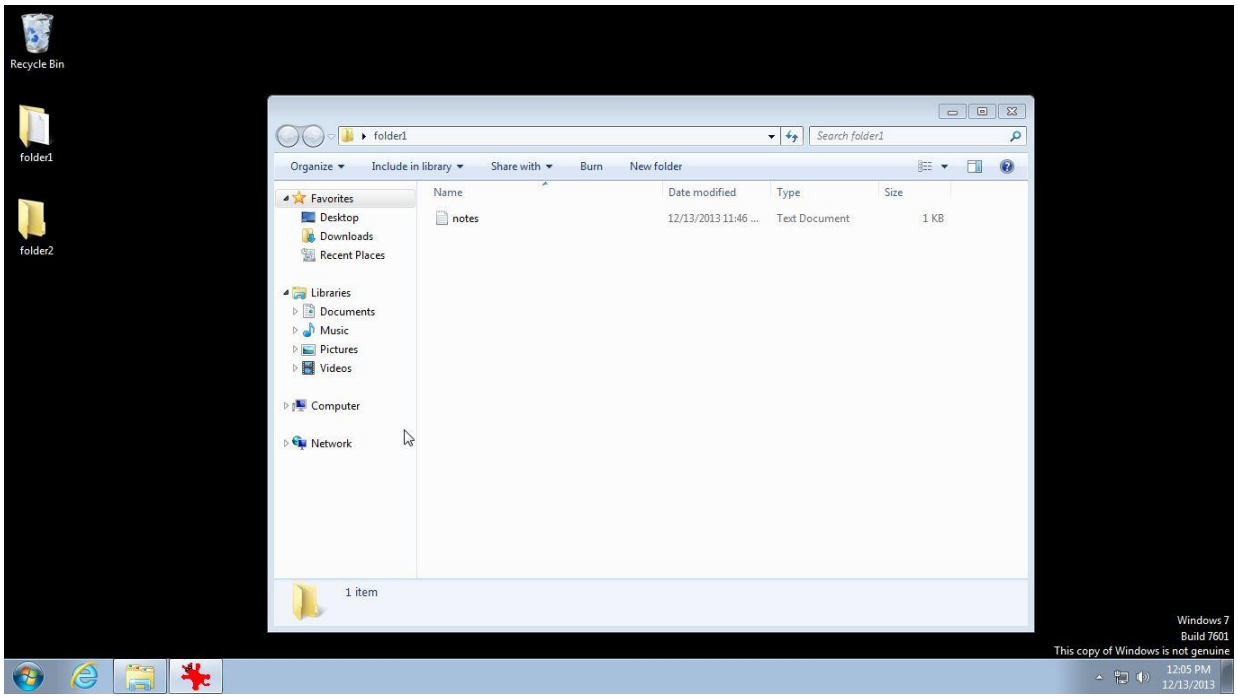

We are then presented with a window that lists all of the previously created restore points. Restore points can be created manually, but are also created automatically whenever updates are installed or new drivers are installed, as well as just before each time the system is rolled back to a restore point. We select our previously created restore point and then click "next".


Confirm your restore point
Your computer will be restored to the state it was in before the event in the Description field below.
Time: 12/13/2013 11:23:53 AM (GMT Standard Time)
Description: Manual: Pre Machine Name Change
Drives:
Local Disk (C:) (System)
Scan for affected programs
If you have changed your Windows password recently, we recommend that you create a password reset disk. Create a password reset disk.
System Restore needs to restart your computer to apply these changes. Before you proceed, save any open files and close all programs.
< Back
Finish
Cancel

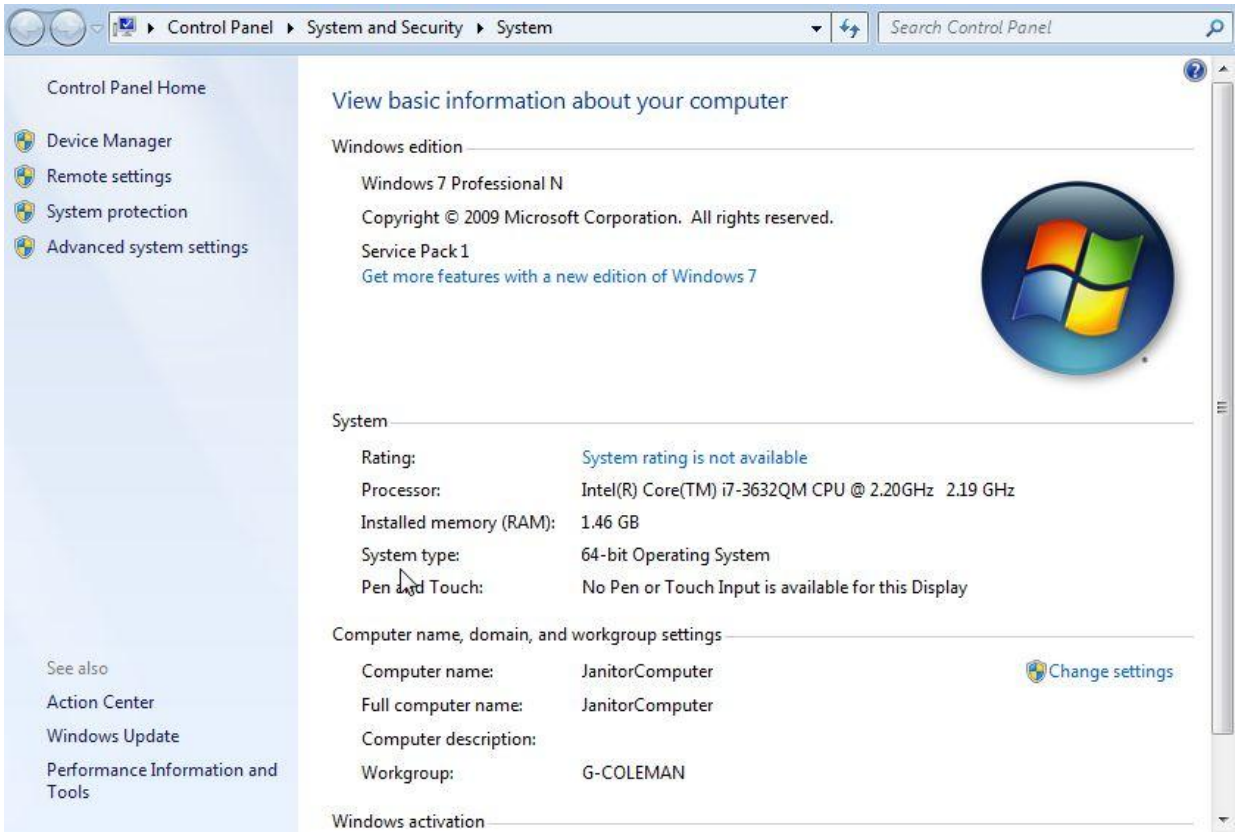
We are then asked to confirm the restore point we have selected and we click "finish", after which


System Restore completed successfully. The system has been restored to 12/13/2013 11:23:53 AM. Your documents have not been affected.
Close

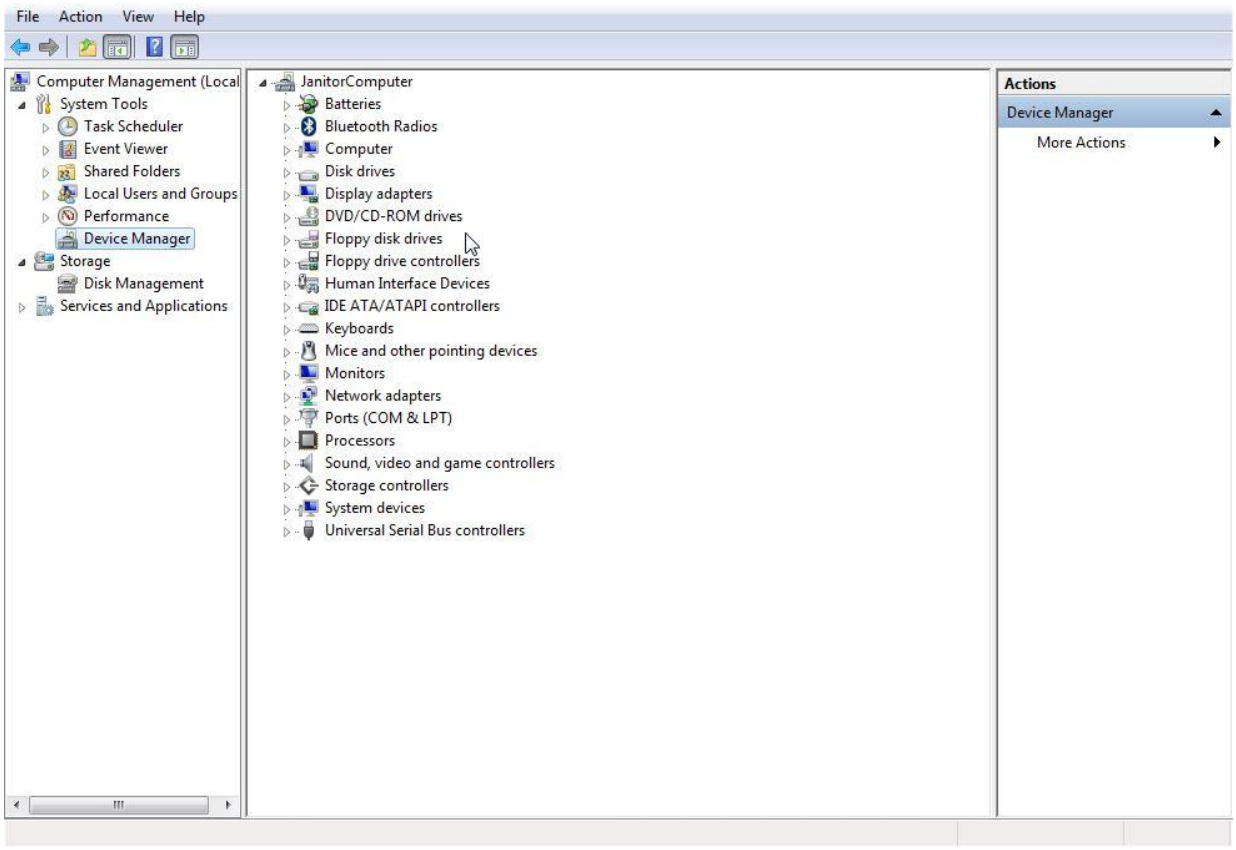
A confirmation dialog advises that the system restore completed successfully.




We see that the system restore utility does not affect any data, with both created folders remaining, and with the notes text file still present in folder1.




We can see in system properties that the computer name has reverted back to JanitorComputer, the name it had before we changed it to mc1.

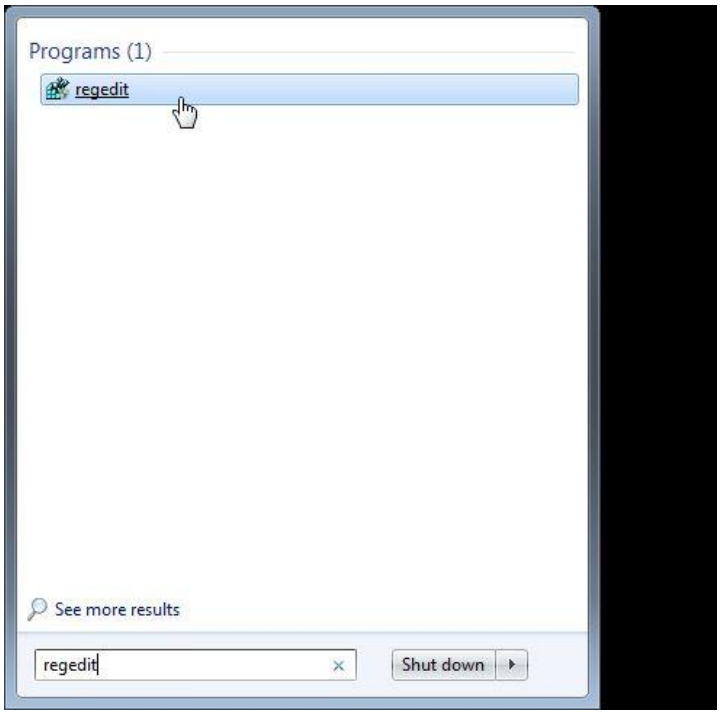



When we open the computer management utility, under device manager, we can see that the floppy drive has been re-enabled.

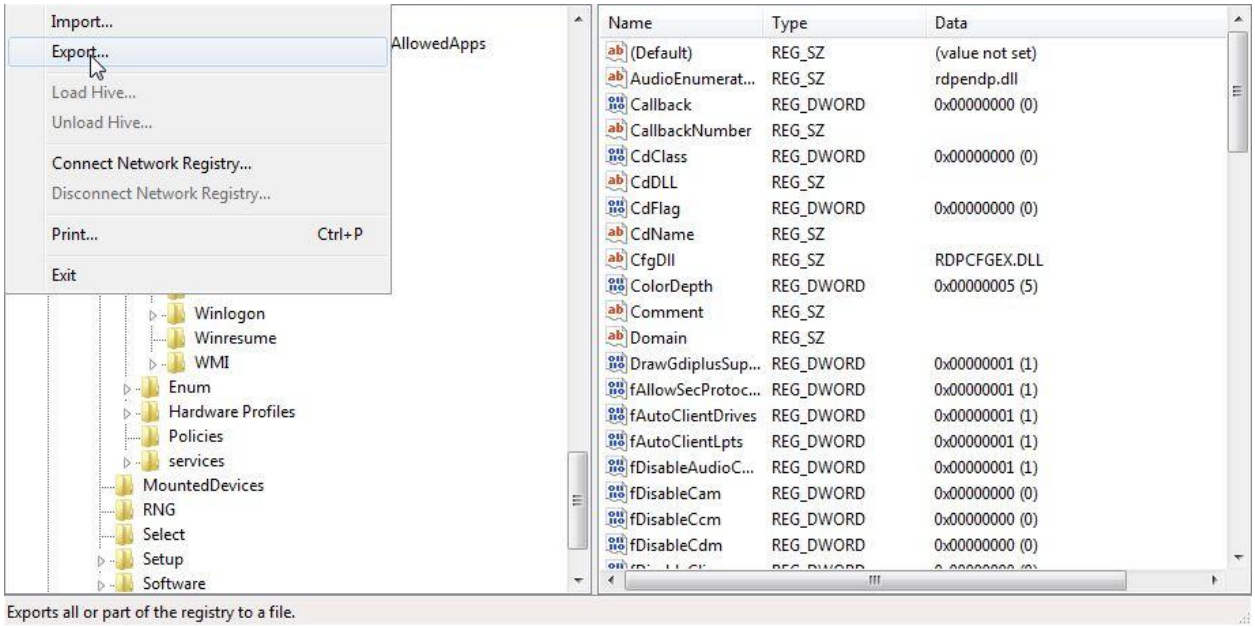
---

## Task A.8 - System Registry

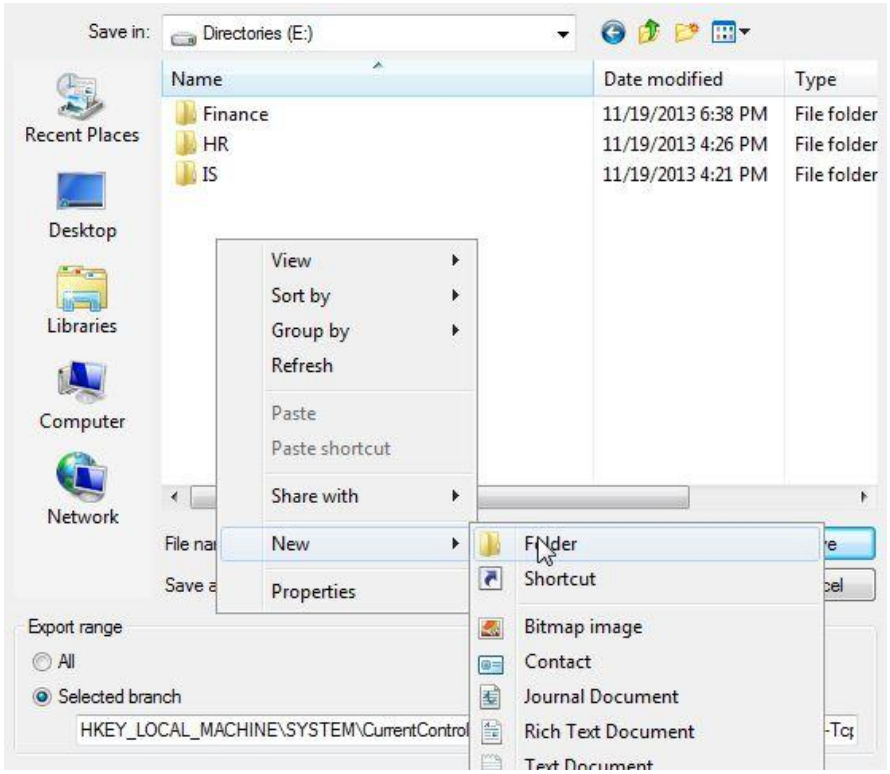
### A.8.1 - Creating a Backup of The Registry



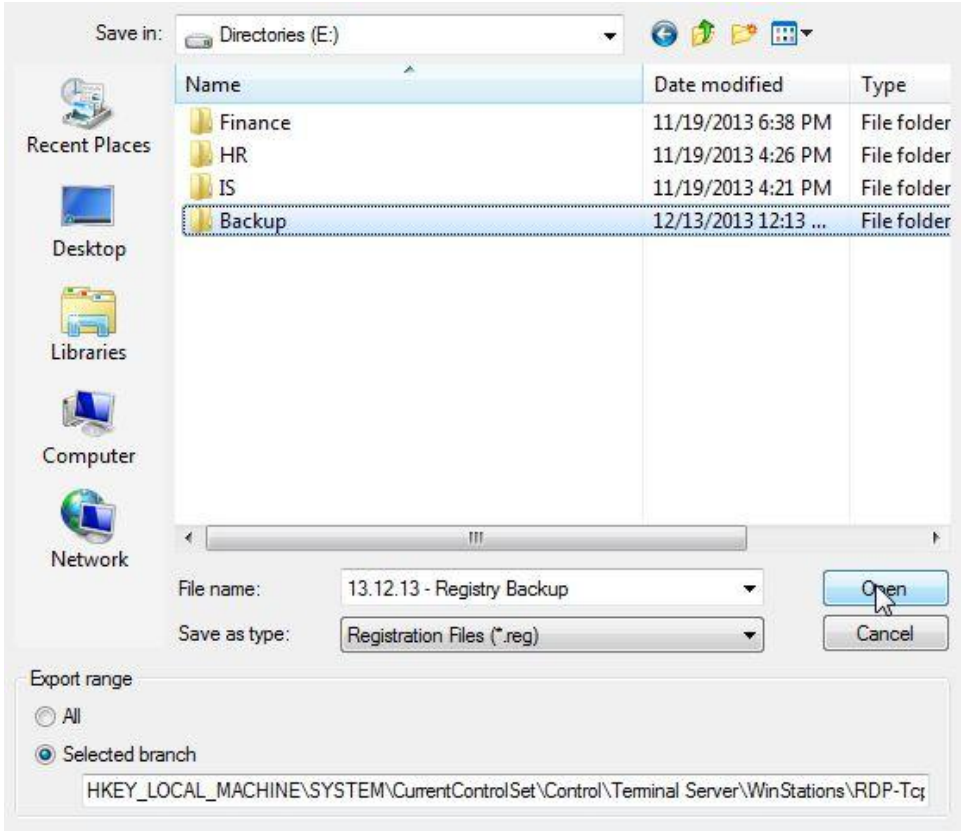

From the ever reliable "start" menu we type "regedit" into the search field and open the registry editor.



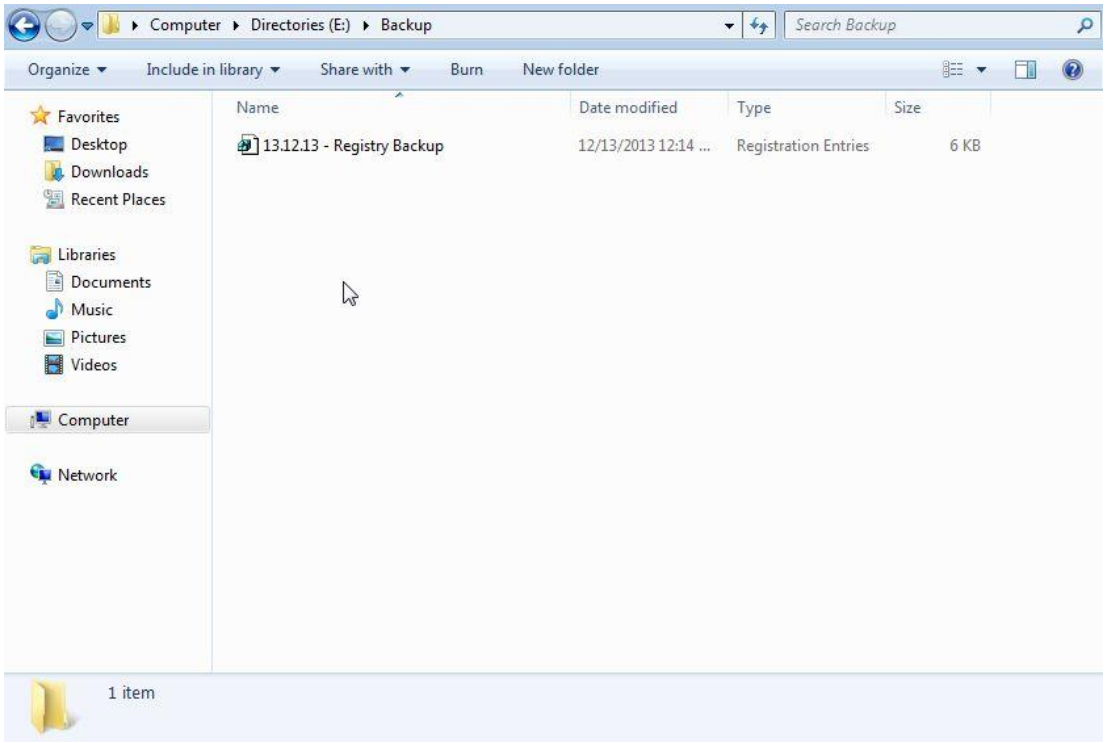

We then click "file" and "export".




We then click "computer", select the "directories (E)" partition that we created earlier, and right click within the window to access the "new" and "folder" options, where we create a new folder called "backup".




We then click once on this new folder to assign this as the export location for the backup of the registry, and having given the backup a name, we click on "open" to confirm it.

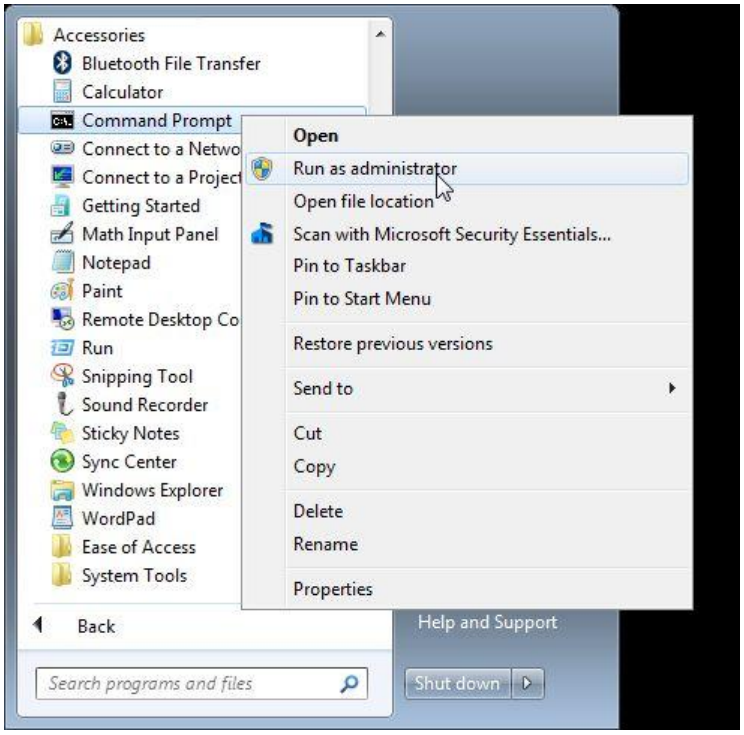



The registry now has a backup located in the backup folder.

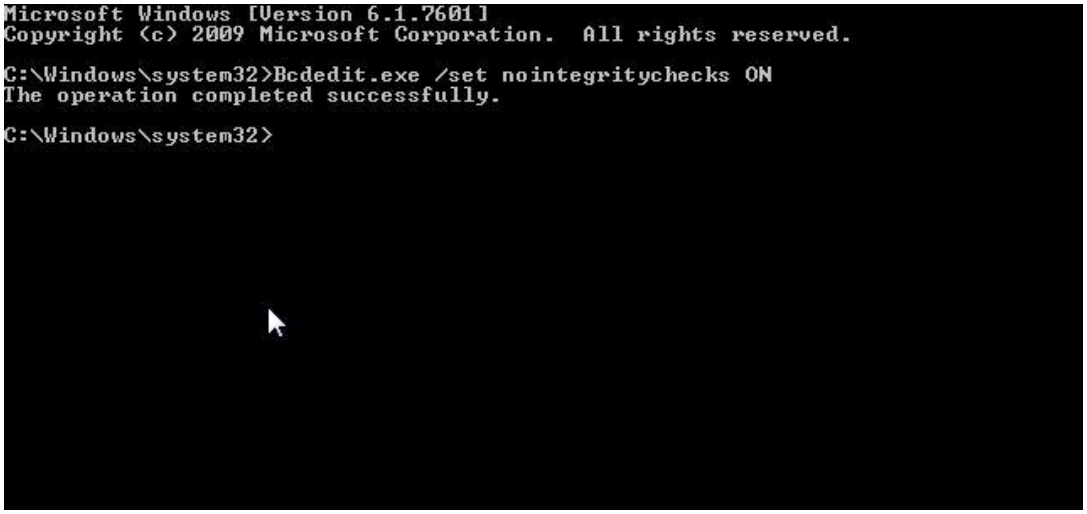
## Task A.9 - Driver Compatibility

### A.9.1 - Preventing Unsigned Drivers from Being Installed

Driver signing associates a digital signature with a driver package. Windows device installation uses digital signatures to verify the integrity of driver packages and to verify the identity of the vendor (software publisher) who provides the driver packages.




We access the command prompt from the "start" menu, within the "accessories" folder within the "programs" folder. We right click on the command prompt icon and select "run as administrator", and select "yes" to continue after the user account control warning.


Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Windows\system32>Bcdedit.exe /set nointegritychecks ON
The operation completed successfully.
C:\Windows\system32>

Within the command prompt we then enter "Bcedit.exe /set nointegritychecks ON". This is in fact turning driver signing off, as it is enabled by default in Windows 7, to re-enable it we simply repeat the above command, replacing "ON" with "OFF".

## Section B - Machine 2 - Linux Debian Operating System

## Task B.1 - Web-Servers

### B.1.0 - Comparison of Windows and Linux as Hosting Platforms

In relation to our hypothetical customer who is seeking advice on the benefits and drawbacks to using both windows and Linux as a hosting platform, a brief discursive comparison of the two is of benefit, following which, having seen a variety of practical tasks associated with a windows installation, we will detail some common taks associated with a linux debian installation.

While web hosting systems are very varied, there are really only two kinds with variations of each in existence. The two choices are Windows and Linux. The decision to choose one web hosting system over another generally comes down to which type of scripting languages the customer needs.

**Linux hosting**
Linux was once the leader of the web hosting world. While the Linux web hosting platform is still the most popular, it has decreased in popularity in recent times because of the emergence of Windows.

Linux offers several benefits over Windows including:

- Cost
  For web hosts, Linux is free, which is a significant advantage over Windows.
- Diverse scripting language support:
  Whether a customer needs PHP, Ruby on Rails, Perl, or Python, a Linux web hosting platform will usually support them all by default.

Linux disadvantages include:

- ASP and .NET support:
  It is rare to find a Linux web hosting platform that supports ASP or .NET.

**Windows hosting**
It is a common misconception for customers to think that they need to get Windows hosting because their desktop computer is using Windows. This is not the case. A Windows server is very different to a Windows desktop and most interaction with a web server is through FTP or a web interface.

One of the biggest advantages of Windows hosting over Linux hosting is:

- The ability to run classic ASP or .NET scripts:
  These languages are very powerful and are becoming increasingly popular.

The disadvantages of a Windows hosting platform include:

- Availability:
  Windows is currently much less popular than Linux so it can be difficult to find a Windows web hosting system with the exact features that the customer may need.
- Cost:
  Windows web hosting usually costs more than Linux web hosting, sometimes by a substantial amount.

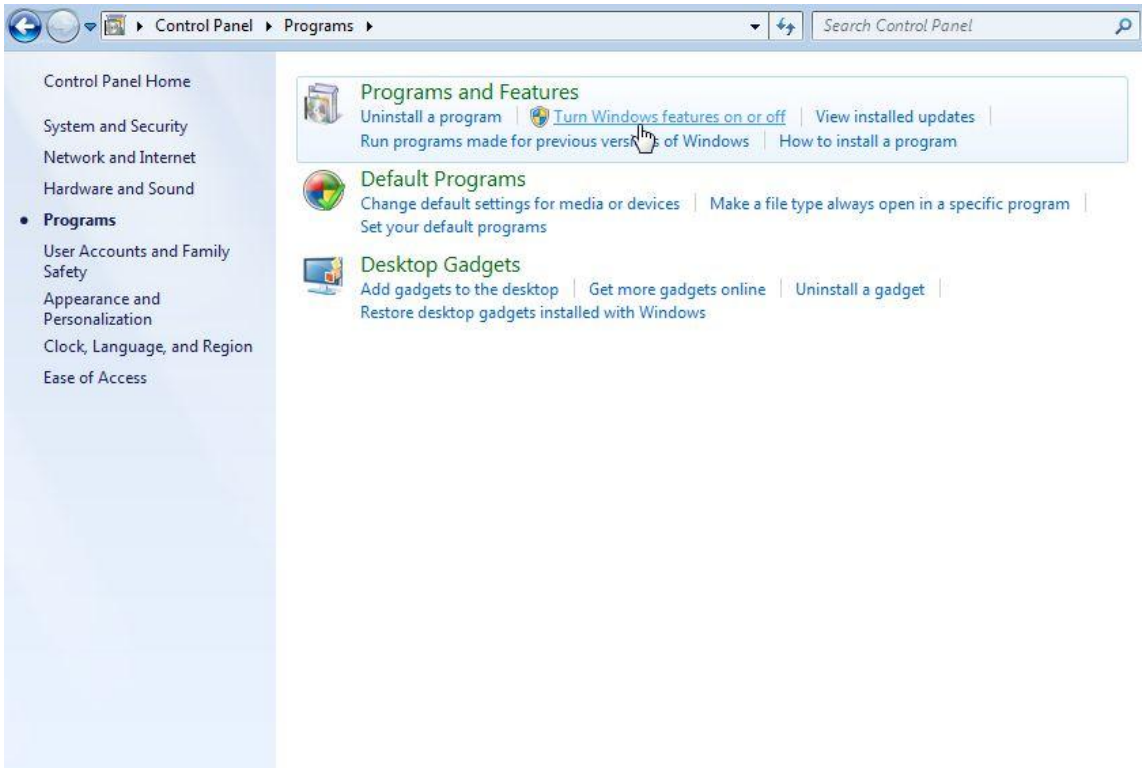
**Similarities between Windows and Linux hosting:**

In reality, there are several aspects that are virtually the same whether a customer chooses Windows hosting or Linux hosting:

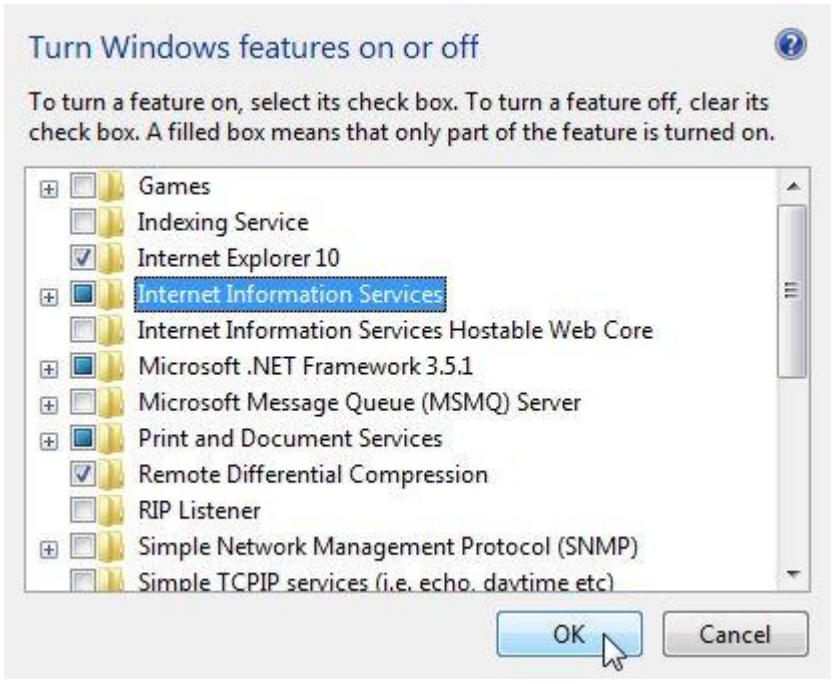
- Performance:
  On both platforms the speed and efficiency will be comparable when an competent administrator manages it.
- Stability:
  While Windows web hosting systems had a deserved reputation for being unstable in the past, the difference in stability between a Windows server and a Linux server today is minimal.
- Ease of use:
- Most interaction with a web hosting system will be through FTP or a server's control panel. So even though Windows provides a user-friendly GUI interface, it isn't hugely necessary.
- Security:
  Today, both web hosting platforms are comparably secure.

---

### B.1.1 - Installing Microsoft's Web-Server


Control Panel ▸ Programs ▸
Search Control Panel
Control Panel Home
System and Security
Network and Internet
Hardware and Sound
Programs
User Accounts and Family Safety
Appearance and Personalization
Clock, Language, and Region
Ease of Access
Programs and Features
Uninstall a program
Turn Windows features on or off
View installed updates
Run programs made for previous versions of Windows
How to install a program
Default Programs
Change default settings for media or devices
Make a file type always open in a specific program
Set your default programs
Desktop Gadgets
Add gadgets to the desktop
Get more gadgets online
Uninstall a gadget
Restore desktop gadgets installed with Windows

We click the "start" menu, followed by "control panel" followed by "programs", from where we click on "turn windows features on or off" under "programs and features".


Turn Windows features on or off
To turn a feature on, select its check box. To turn a feature off, clear its check box. A filled box means that only part of the feature is turned on.
Games
Indexing Service
Internet Explorer 10
Internet Information Services
Internet Information Services Hostable Web Core
Microsoft .NET Framework 3.5.1
Microsoft Message Queue (MSMQ) Server
Print and Document Services
Remote Differential Compression
RIP Listener
Simple Network Management Protocol (SNMP)
Simple TCPIP services (i.e. echo, daytime etc)
OK
Cancel

We then tick the box beside "Internet Information Services" to turn it on and then click "ok". We are then presented with a pop-up that asks us to wait while windows makes changes.

To test if the installation was successful we open the "internet explorer" web browser from the "start" menu, and we enter http://localhost into the address bar. We then see the above screen which confirms that Internet Information Systems (IIS) has installed.

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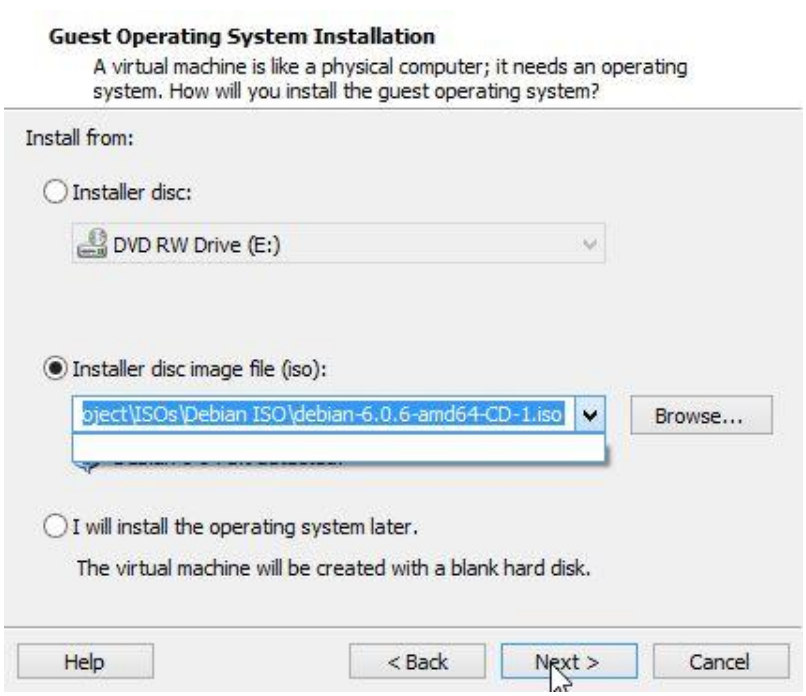
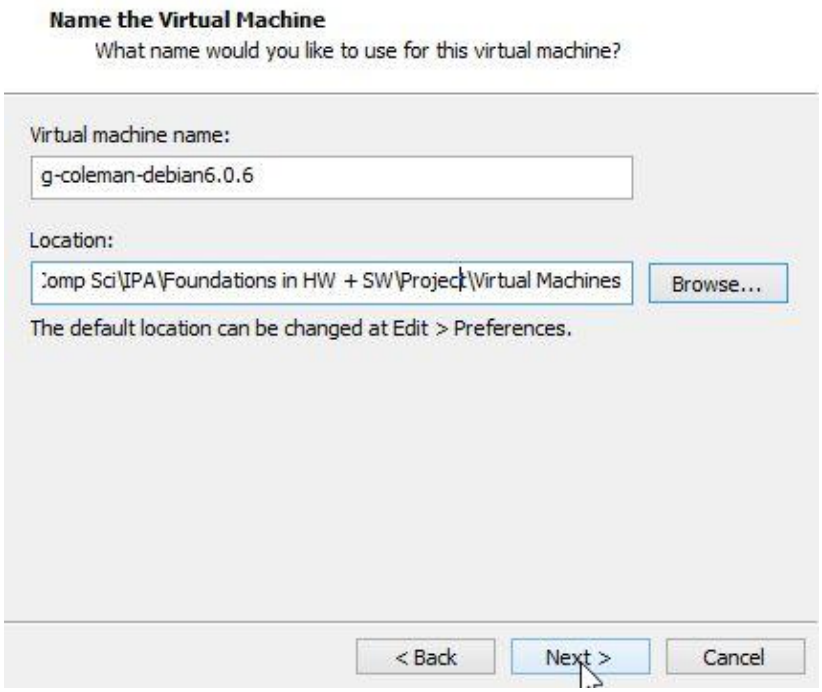
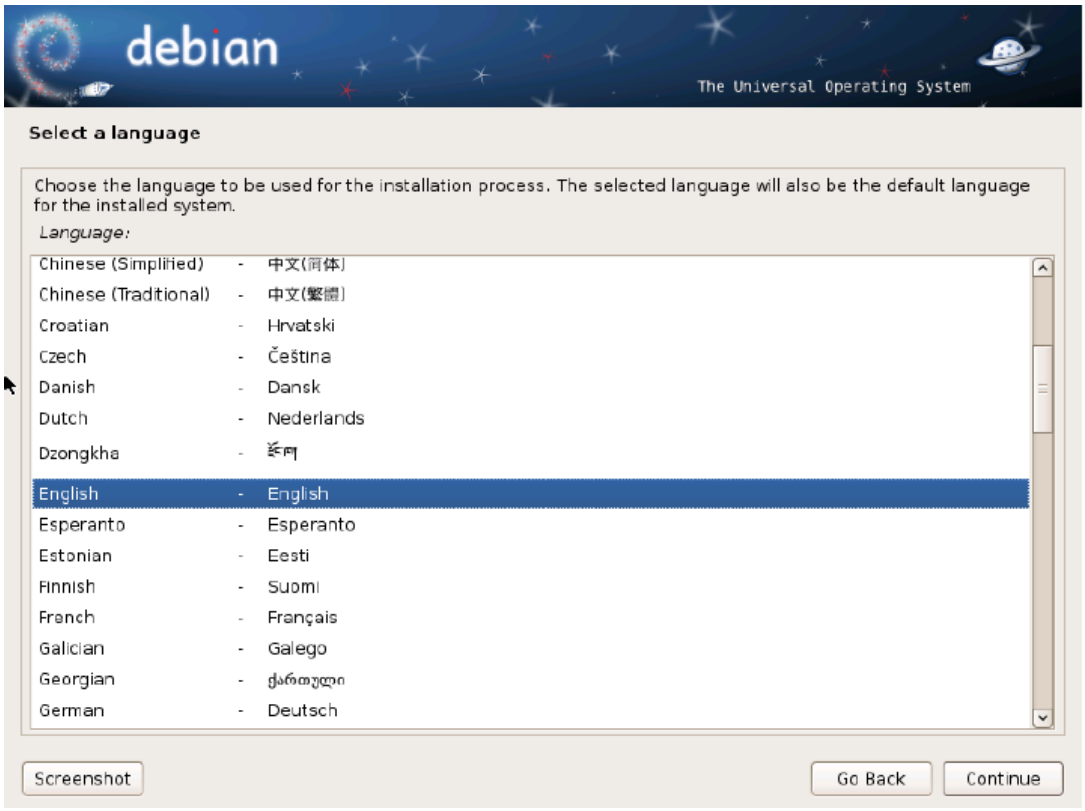
### B.1.2 - Installing Debian Linux


Guest Operating System Installation
A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?
Install from:
Installer disc:
DVD RW Drive (E:)
Installer disc image file (iso):
oject\ISOs\Debian ISO\debian-6.0.6-amd64-CD-1.iso
Browse...
I will install the operating system later.
The virtual machine will be created with a blank hard disk.
Help
< Back
Next >
Cancel

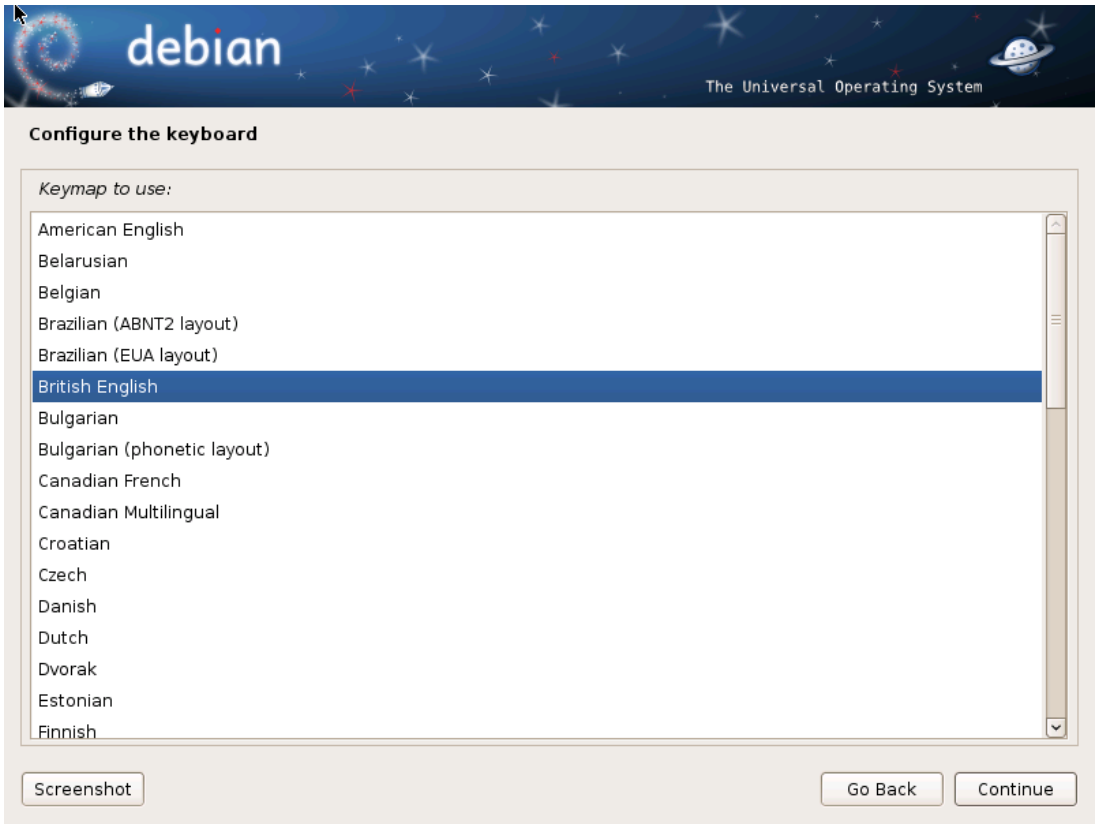
We follow the same method as previously within VMWare Workstation, this time using the Debian 6.0.6 installer disc image file supplied as part of this assignment, with the same specifications in terms of memory allocation etc.


Name the Virtual Machine
What name would you like to use for this virtual machine?
Virtual machine name:
g-coleman-debian6.0.6
Location:
:omp Sci\IPA\Foundations in HW + SW\Project\Virtual Machines
Browse...
The default location can be changed at Edit > Preferences.
< Back
Next >
Cancel

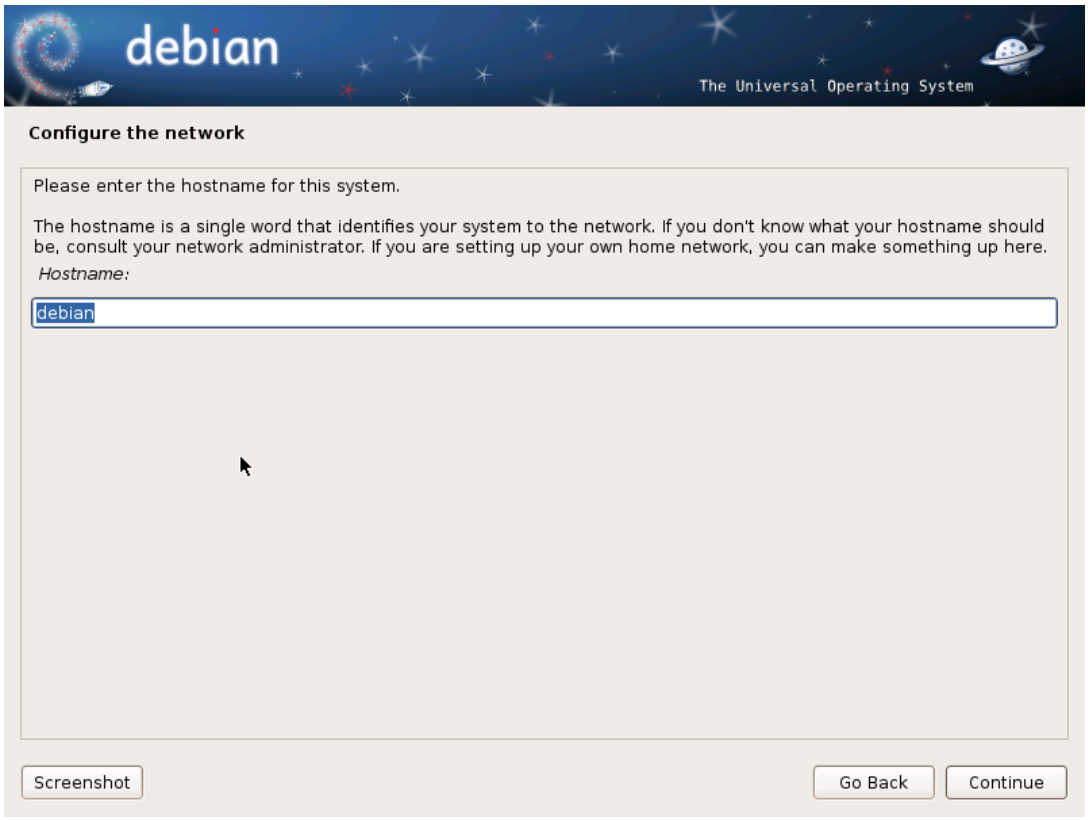
We are then brought to the debian installer boot menu, where we type "G" to use the graphical install and then hit return on our keyboard.



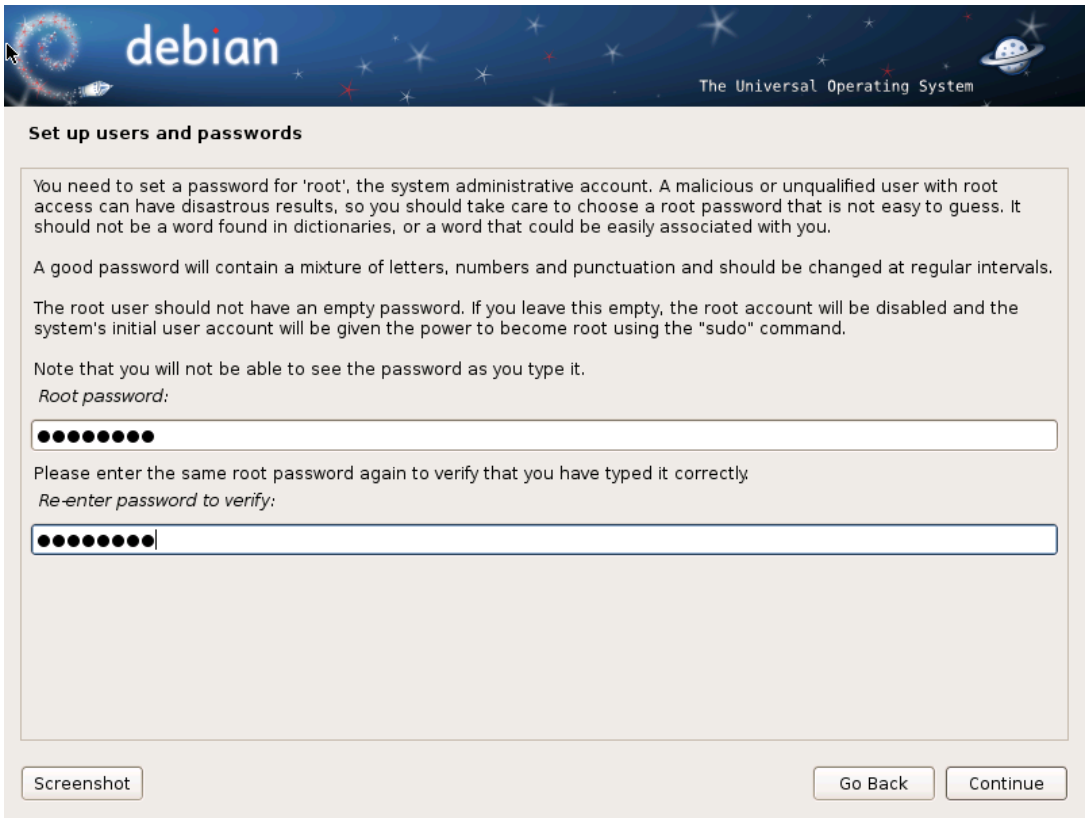

On the language page we select English and then click "continue" to move to the next step.



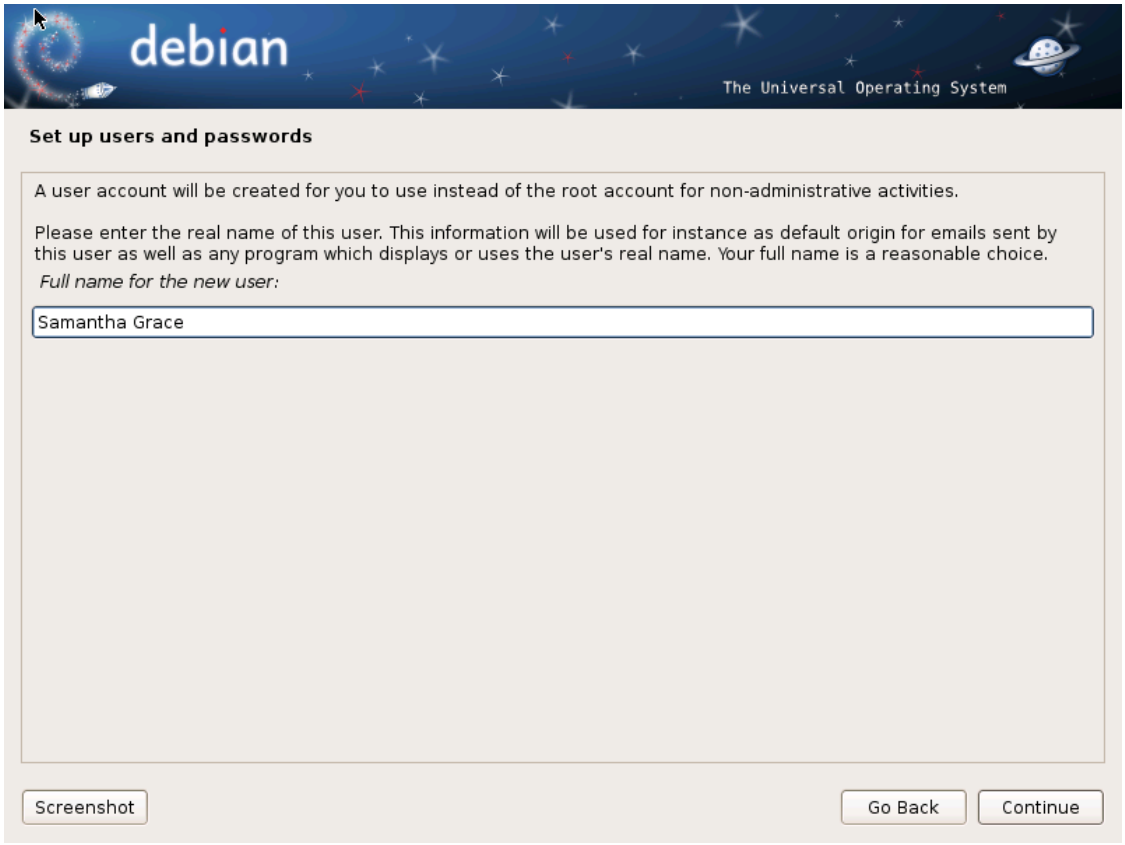

Having chosen Ireland as our location we then select British English as the keymap for our keyboard configuration and click "continue".


debian
The Universal Operating System
Configure the network
Please enter the hostname for this system.
The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.
Hostname:
debian
Screenshot
Go Back
Continue

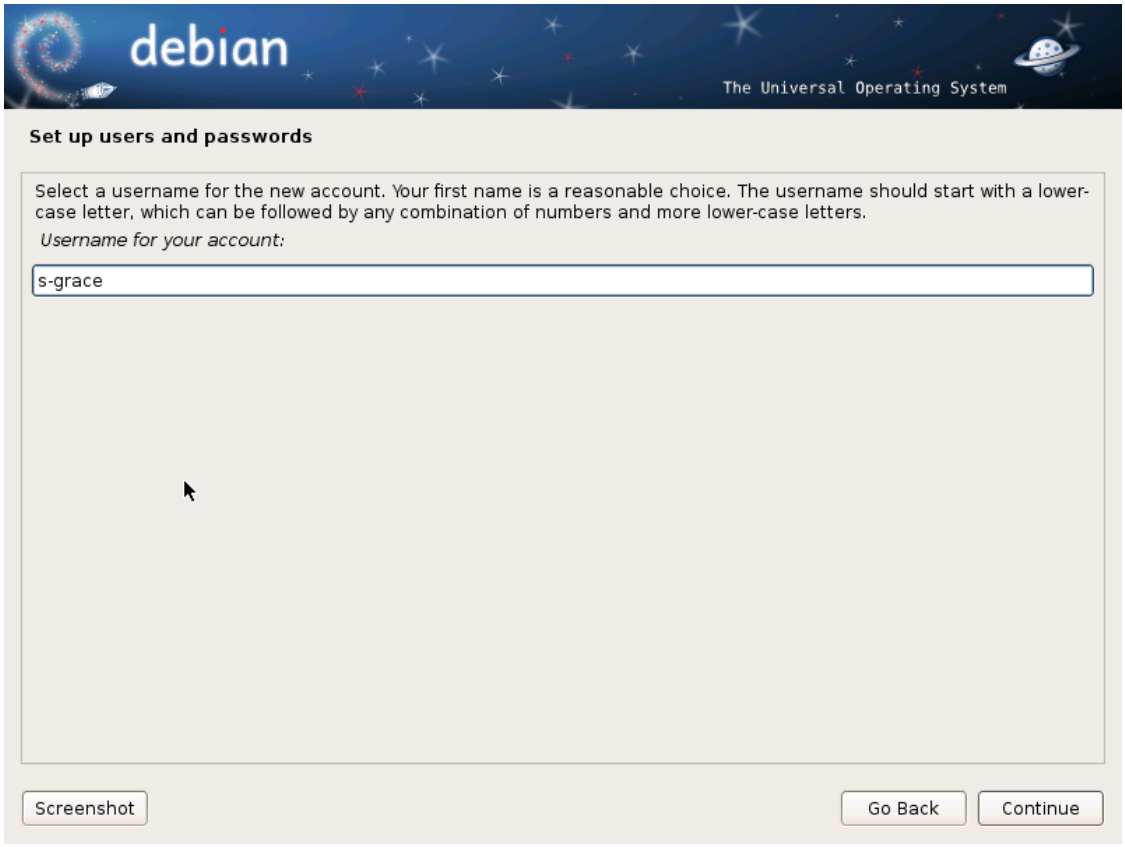
We then leave the host name as the default and hit "continue".


debian
The Universal Operating System
Set up users and passwords
You need to set a password for 'root', the system administrative account. A malicious or unqualified user with root access can have disastrous results, so you should take care to choose a root password that is not easy to guess. It should not be a word found in dictionaries, or a word that could be easily associated with you.
A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.
The root user should not have an empty password. If you leave this empty, the root account will be disabled and the system's initial user account will be given the power to become root using the "sudo" command.
Note that you will not be able to see the password as you type it.
Root password:
Please enter the same root password again to verify that you have typed it correctly.
Re-enter password to verify:
Screenshot
Go Back
Continue

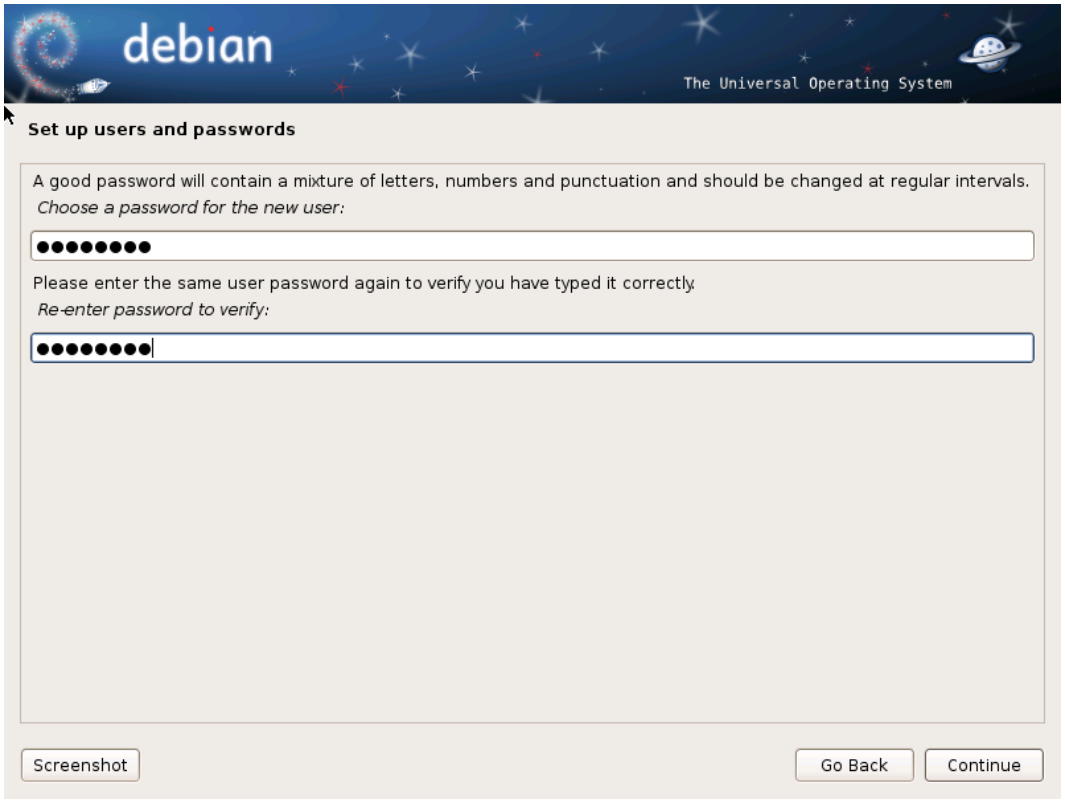
We then enter a password for the system administrative account. For the purposes of this assignment we have used the same password as was used for the windows machine, i.e. Pa$$w0rd, but in reality a more complex password in compliance with best practice would be employed.


debian
The Universal Operating System
Set up users and passwords
A user account will be created for you to use instead of the root account for non-administrative activities.
Please enter the real name of this user. This information will be used for instance as default origin for emails sent by this user as well as any program which displays or uses the user's real name. Your full name is a reasonable choice.
Full name for the new user:
Samantha Grace
Screenshot
Go Back
Continue

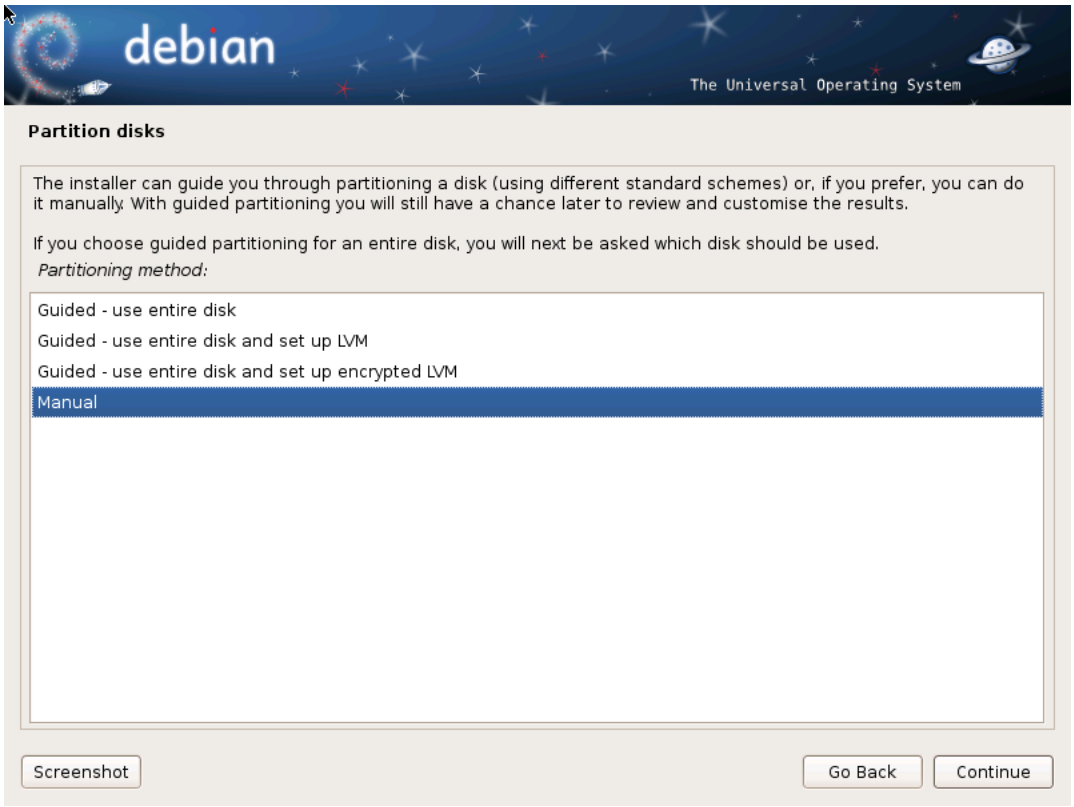
We then setup a user account for Samantha Grace, firstly by entering her name.


debian
The Universal Operating System
Set up users and passwords
Select a username for the new account. Your first name is a reasonable choice. The username should start with a lower-case letter, which can be followed by any combination of numbers and more lower-case letters.
Username for your account:
s-grace
Screenshot
Go Back
Continue

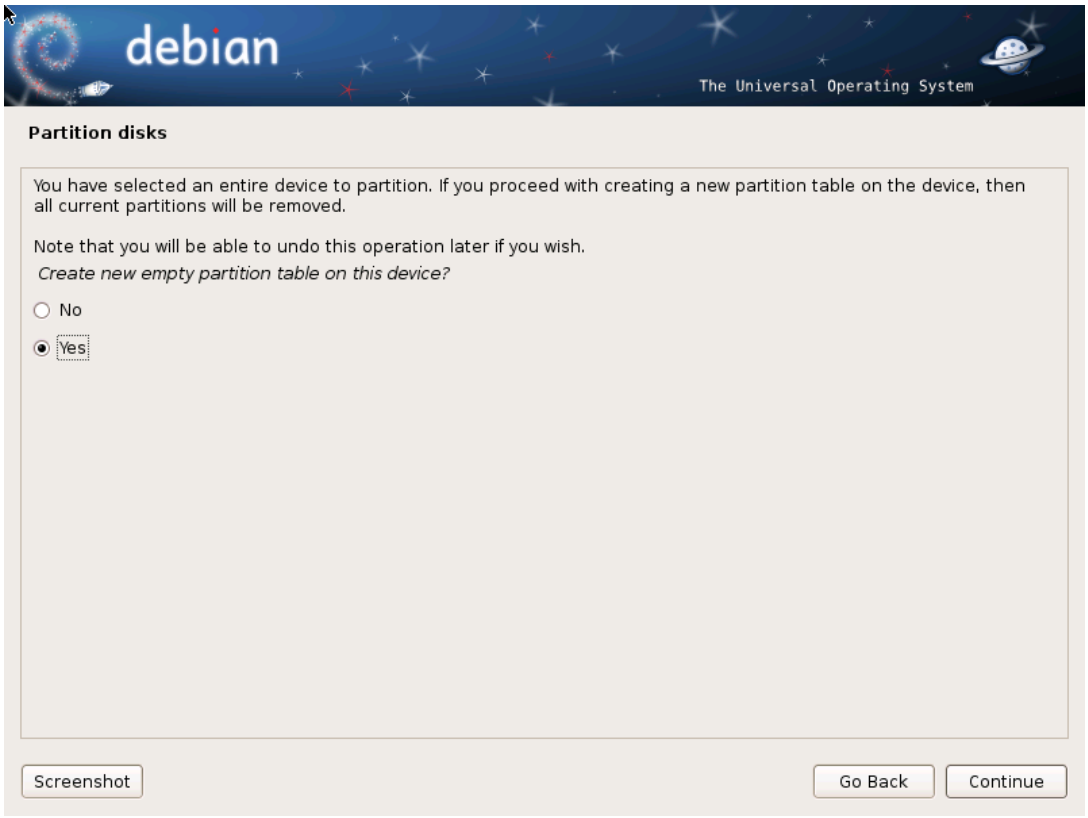
We are then prompted to enter her user name, which we do, and then click on "continue".


debian
The Universal Operating System
Set up users and passwords
A good password will contain a mixture of letters, numbers and punctuation and should be changed at regular intervals.
Choose a password for the new user:
Please enter the same user password again to verify you have typed it correctly.
Re-enter password to verify:
Screenshot
Go Back
Continue

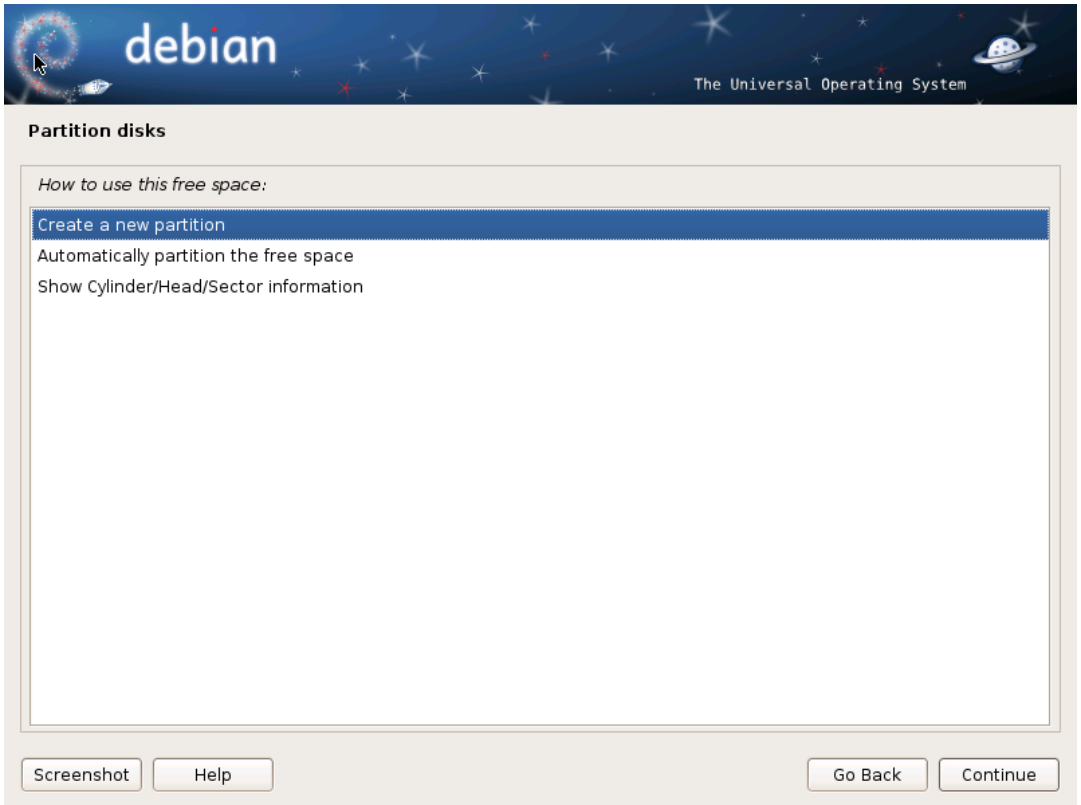
We then type and verify the password for Samantha Grace's account.


debian
The Universal Operating System
Partition disks
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.
Partitioning method:
Guided - use entire disk
Guided - use entire disk and set up LVM
Guided - use entire disk and set up encrypted LVM
Manual
Screenshot
Go Back
Continue

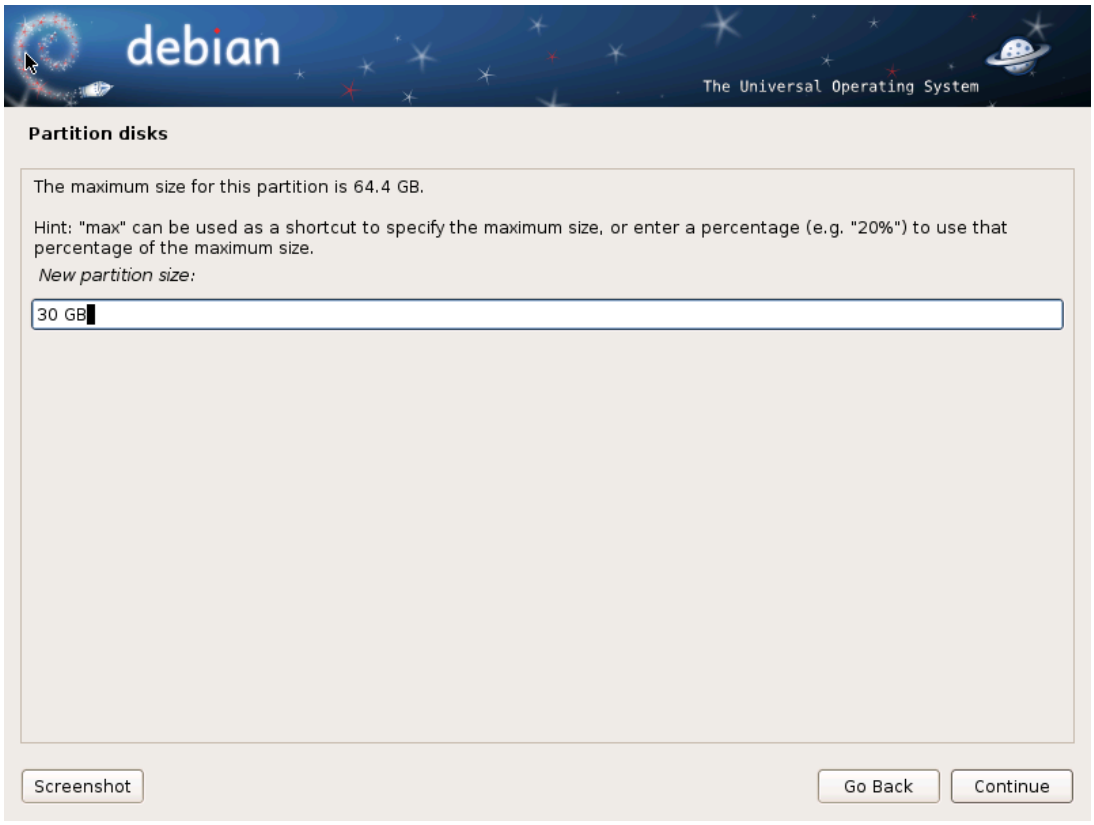
The next window is related to the partitioning of the disk. We select manual, as we wish to partition the hard drive into two disks.


debian
The Universal Operating System
Partition disks
You have selected an entire device to partition. If you proceed with creating a new partition table on the device, then all current partitions will be removed.
Note that you will be able to undo this operation later if you wish.
Create new empty partition table on this device?
No
Yes
Screenshot
Go Back
Continue

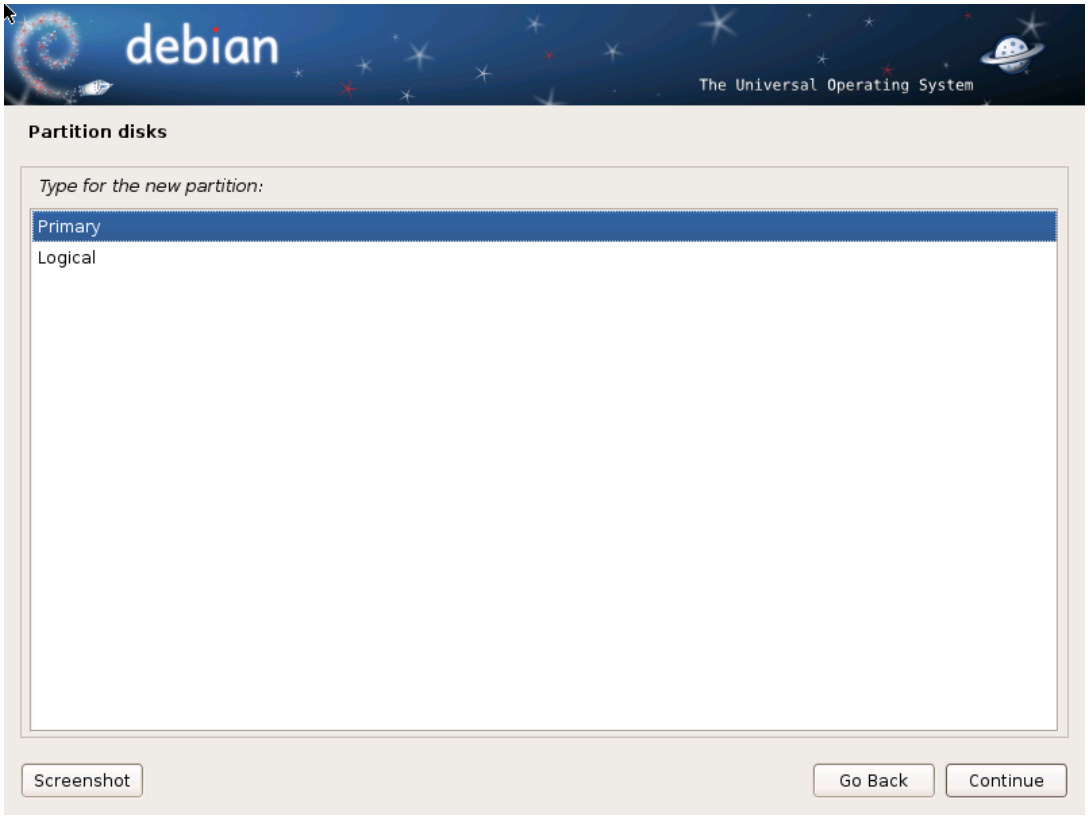
Select "yes" and "continue".



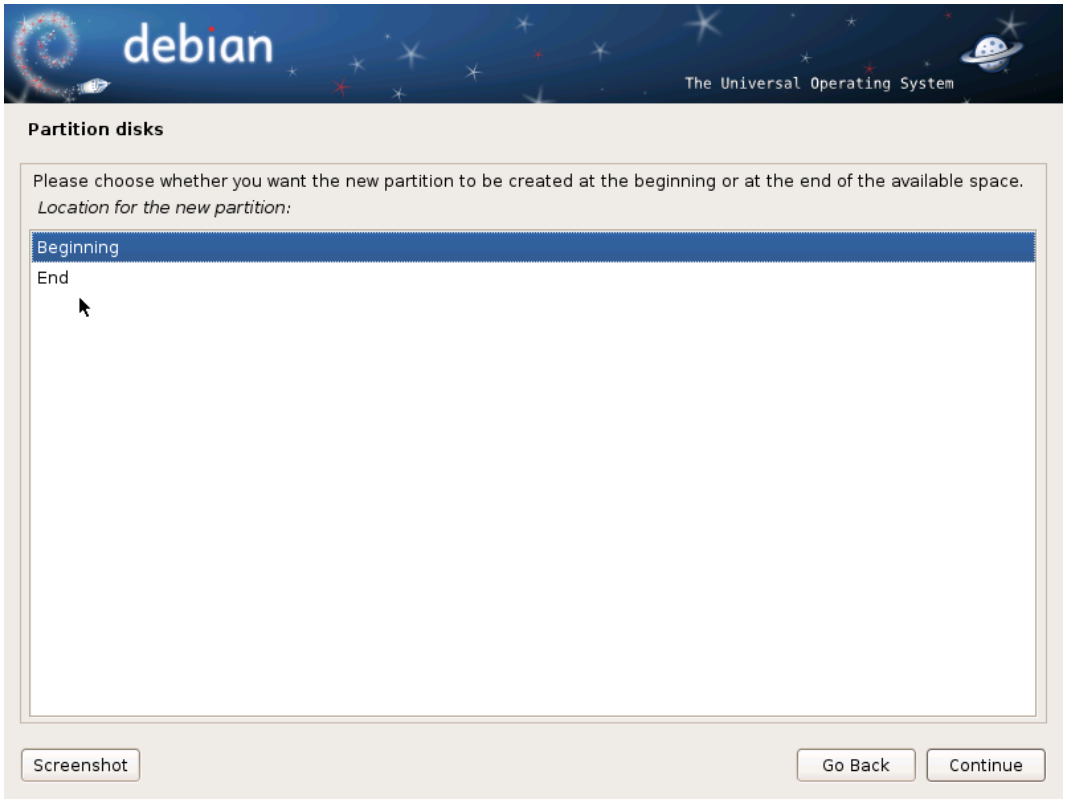

We then select "create a new partition" and click "continue".


debian
The Universal Operating System
Partition disks
The maximum size for this partition is 64.4 GB.
Hint: "max" can be used as a shortcut to specify the maximum size, or enter a percentage (e.g. "20%") to use that percentage of the maximum size.
New partition size:
30 GB
Screenshot
Go Back
Continue

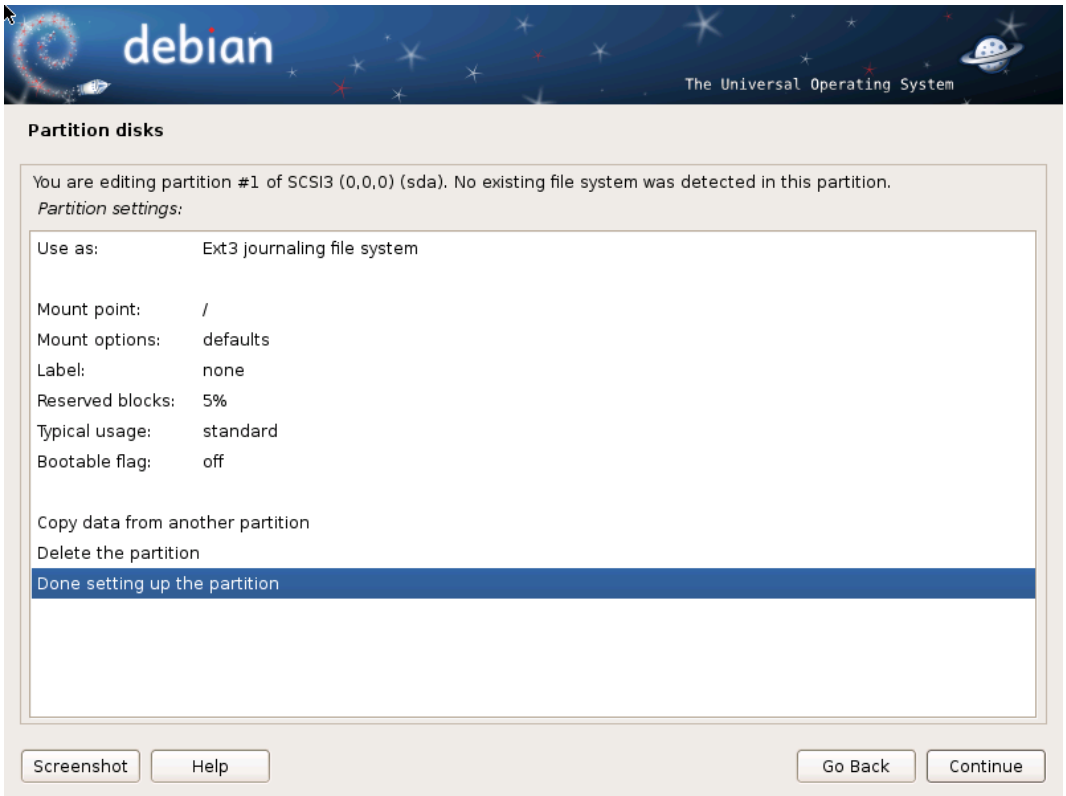
We then enter the size of this first partition as 30GB and hit "continue".



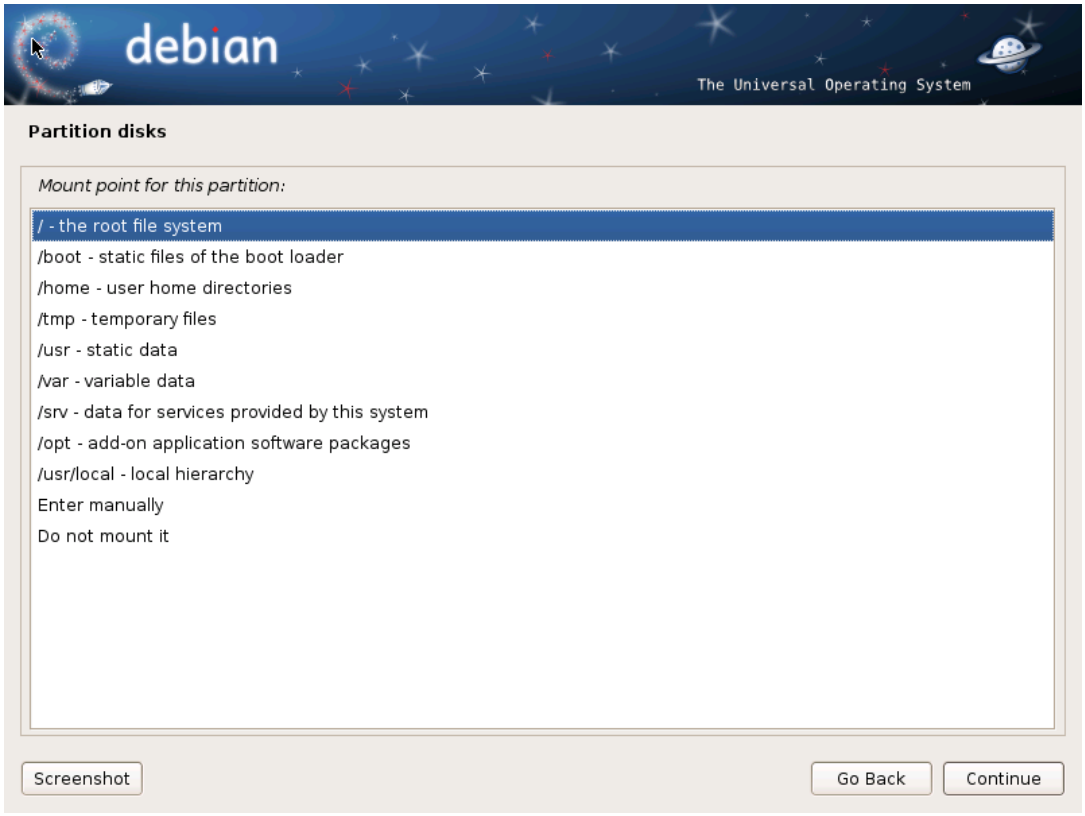

We set this first partition as the primary partition and hit "continue".


debian
The Universal Operating System
Partition disks
Please choose whether you want the new partition to be created at the beginning or at the end of the available space.
Location for the new partition:
Beginning
End
Screenshot
Go Back
Continue

We select for the partition to be created at the beginning of the available disk space and hit "continue".

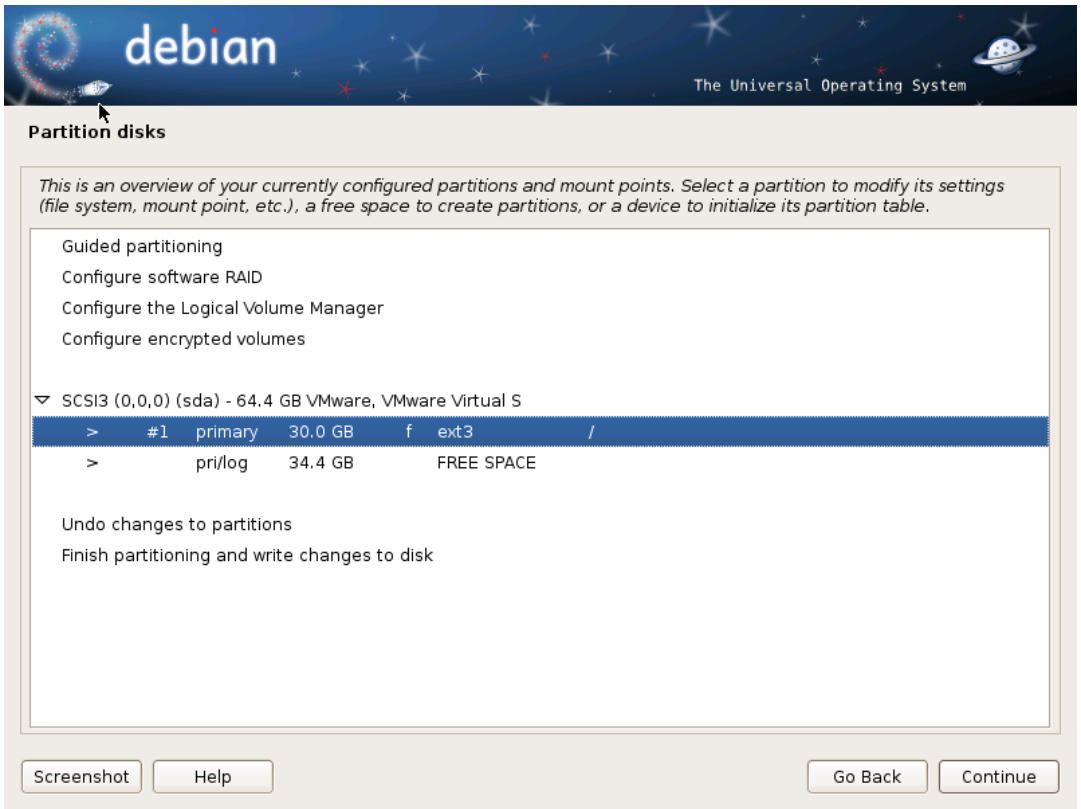



In the "Use as:" setting option, we select "Ext3 journaling File System".

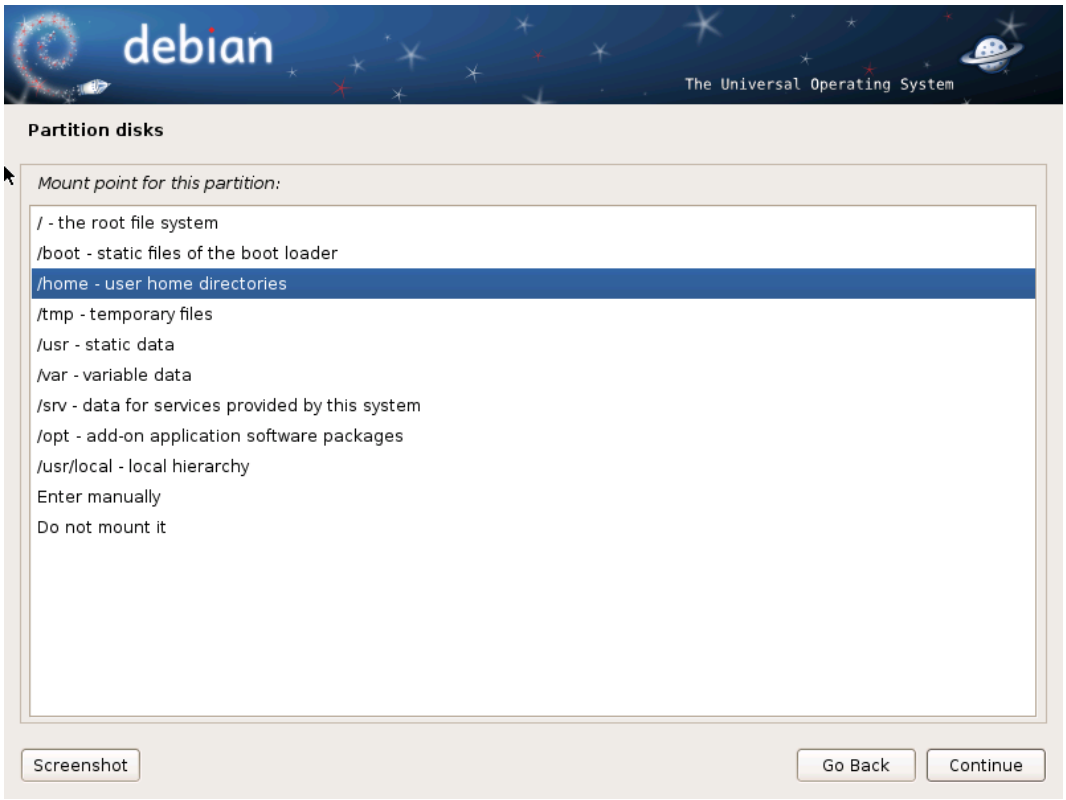

debian
The Universal Operating System
Partition disks
Mount point for this partition:
/ - the root file system
/boot - static files of the boot loader
/home - user home directories
/tmp - temporary files
/usr - static data
/var - variable data
/srv - data for services provided by this system
/opt - add-on application software packages
/usr/local - local hierarchy
Enter manually
Do not mount it
Screenshot
Go Back
Continue

For the mount point we select "/ - the root file system" , and "continue".

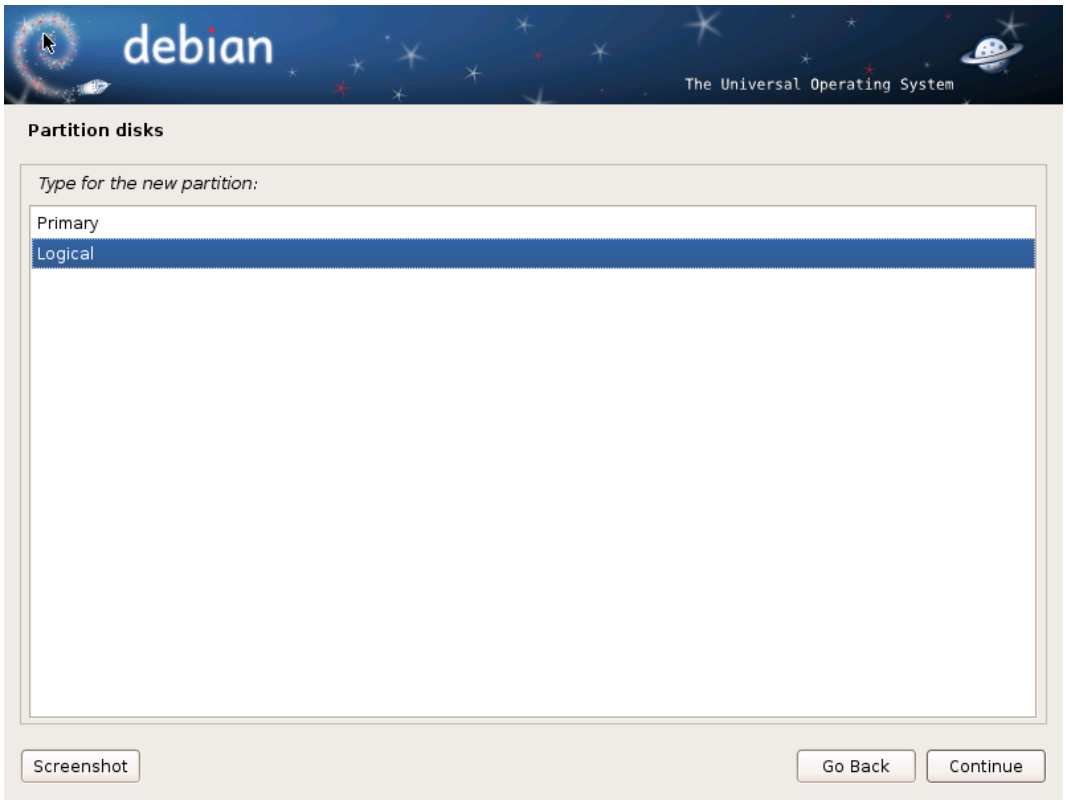
We then click once on "done setting up the partition" to highlight it, and then click "continue".


debian
The Universal Operating System
Partition disks
This is an overview of your currently configured partitions and mount points. Select a partition to modify its settings (file system, mount point, etc.), a free space to create partitions, or a device to initialize its partition table.
Guided partitioning
Configure software RAID
Configure the Logical Volume Manager
Configure encrypted volumes
SCSI3 (0,0,0) (sda) - 64.4 GB VMware, VMware Virtual S
> #1 primary 30.0 GB f ext3 /
> pri/log 34.4 GB FREE SPACE
Undo changes to partitions
Finish partitioning and write changes to disk
Screenshot
Help
Go Back
Continue

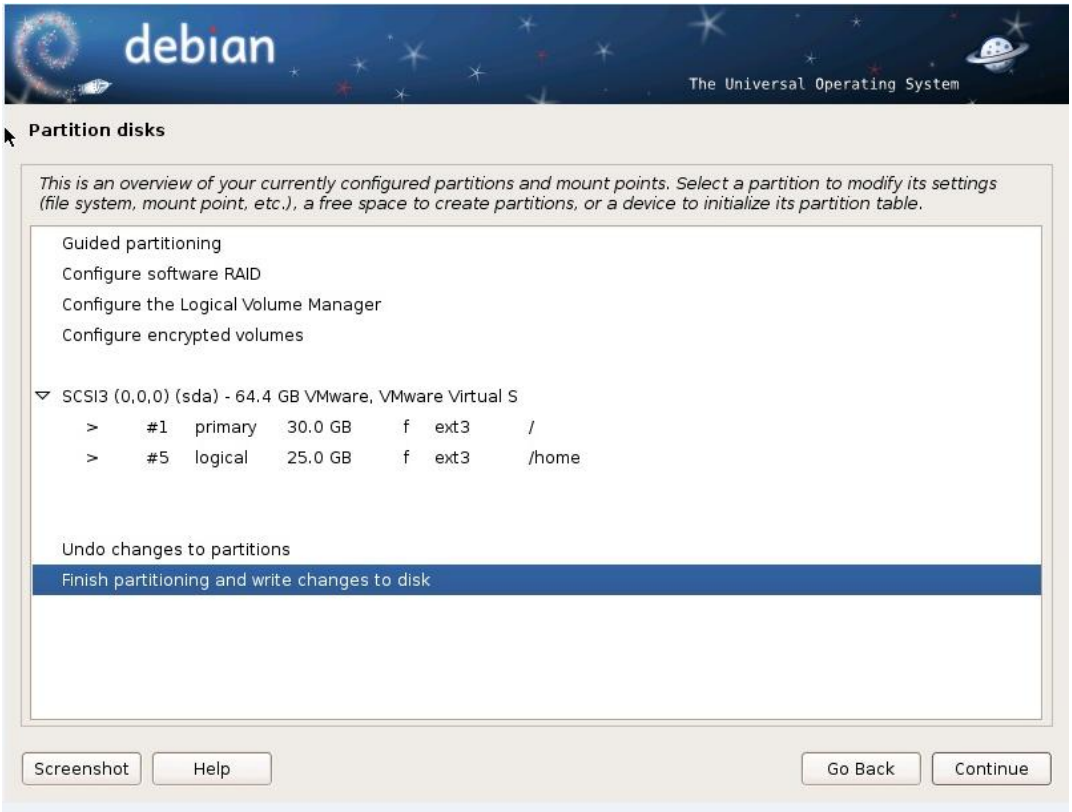
We are then presented with a partition disks overview, where if we double click on the free space we can assign the remaining space to our directories partition.


debian
The Universal Operating System
Partition disks
Mount point for this partition:
/ - the root file system
/boot - static files of the boot loader
/home - user home directories
/tmp - temporary files
/usr - static data
/var - variable data
/srv - data for services provided by this system
/opt - add-on application software packages
/usr/local - local hierarchy
Enter manually
Do not mount it
Screenshot
Go Back
Continue

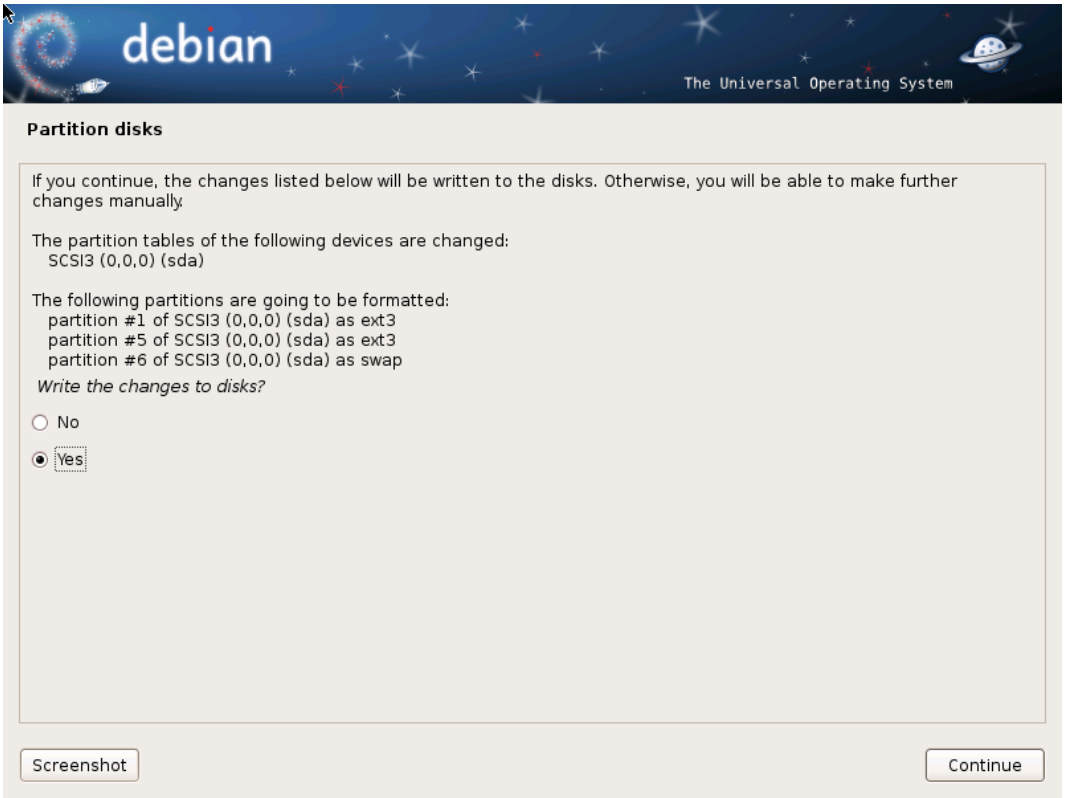
The same process as above is repeated, however this time we select the mount point as "/home - user home directories".



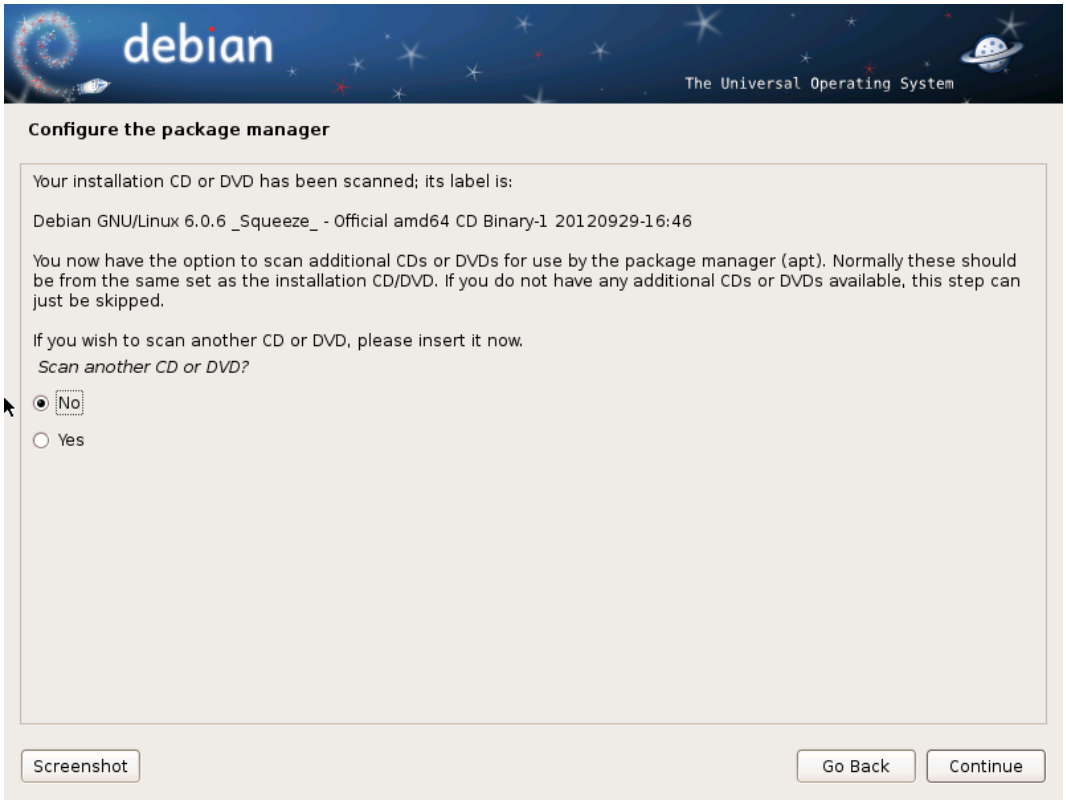

We also set the disk type as a logical disk rather than the primary disk.


debian
The Universal Operating System
Partition disks
This is an overview of your currently configured partitions and mount points. Select a partition to modify its settings (file system, mount point, etc.), a free space to create partitions, or a device to initialize its partition table.
Guided partitioning
Configure software RAID
Configure the Logical Volume Manager
Configure encrypted volumes
SCSI3 (0,0,0) (sda) - 64.4 GB VMware, VMware Virtual S
> #1 primary 30.0 GB f ext3 /
> #5 logical 25.0 GB f ext3 /home
Undo changes to partitions
Finish partitioning and write changes to disk
Screenshot
Help
Go Back
Continue

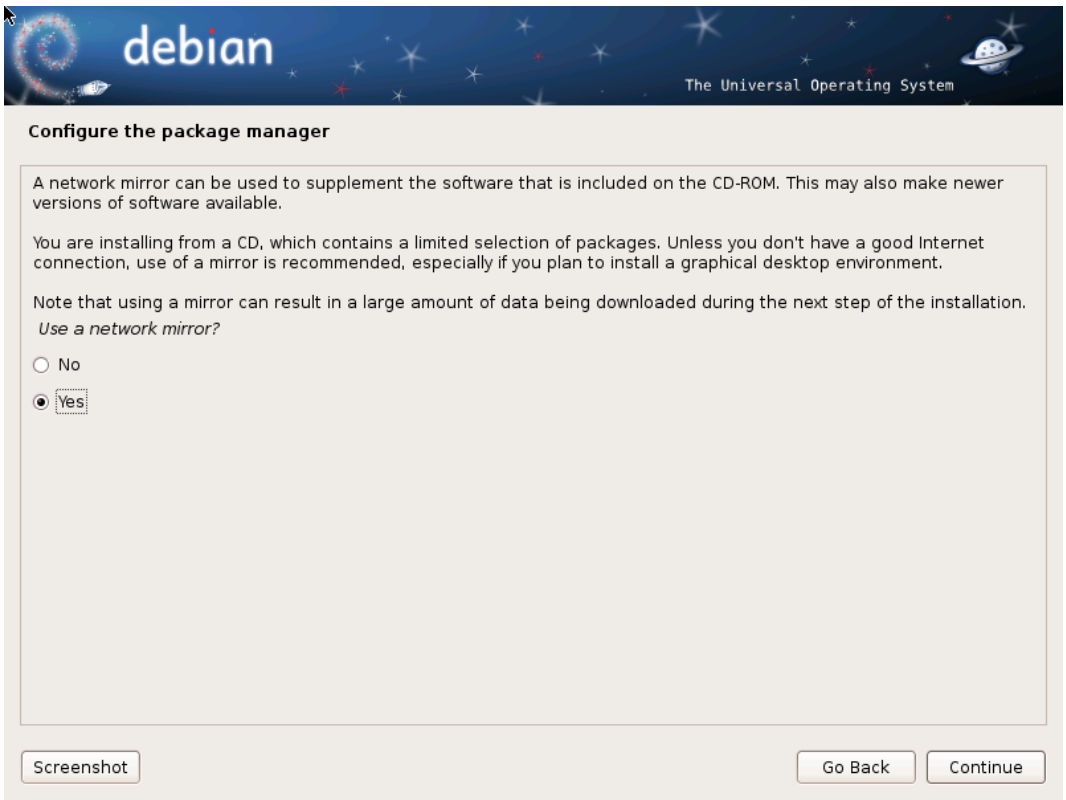
The partition disk overview now shows the 2 partitions we have created, and we click once on "finish partitioning and write changes to disk", and then click "continue".


debian
The Universal Operating System
Partition disks
If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.
The partition tables of the following devices are changed:
SCSI3 (0,0,0) (sda)
The following partitions are going to be formatted:
partition #1 of SCSI3 (0,0,0) (sda) as ext3
partition #5 of SCSI3 (0,0,0) (sda) as ext3
partition #6 of SCSI3 (0,0,0) (sda) as swap
Write the changes to disks?
No
Yes
Screenshot
Continue

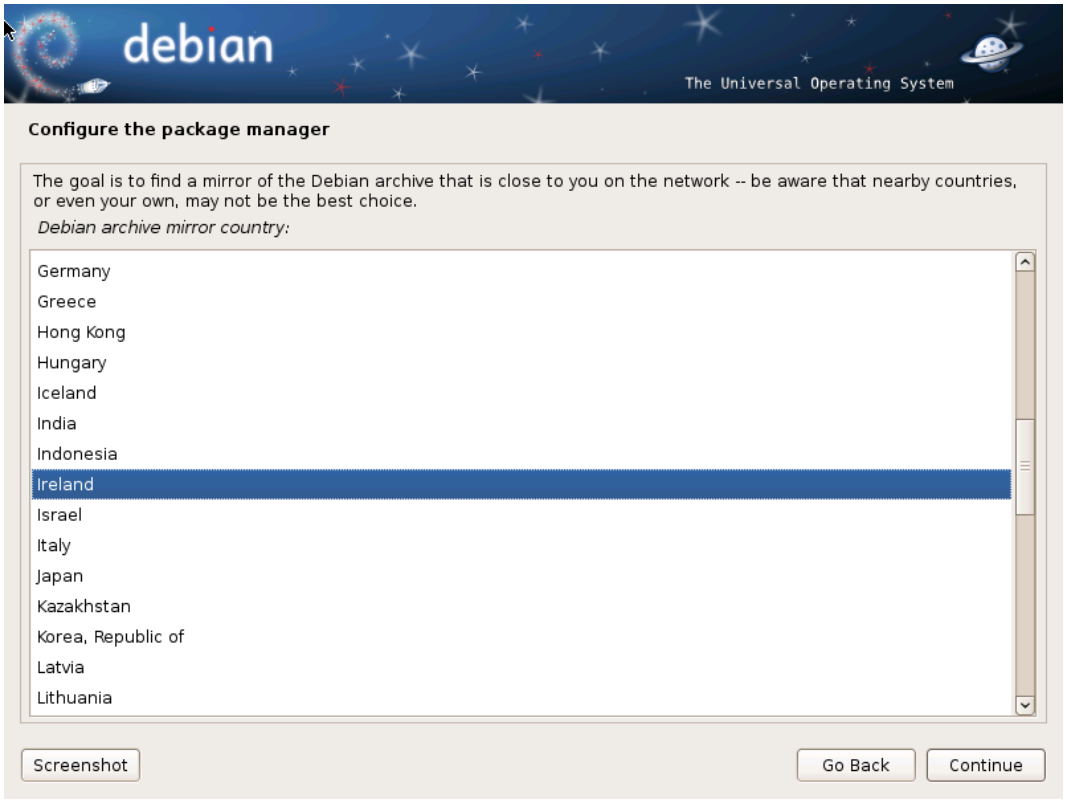
We then select "yes" to confirm the changes and click "continue".


debian
The Universal Operating System
Configure the package manager
Your installation CD or DVD has been scanned; its label is:
Debian GNU/Linux 6.0.6 _Squeeze_ - Official amd64 CD Binary-1 20120929-16:46
You now have the option to scan additional CDs or DVDs for use by the package manager (apt). Normally these should be from the same set as the installation CD/DVD. If you do not have any additional CDs or DVDs available, this step can just be skipped.
If you wish to scan another CD or DVD, please insert it now.
Scan another CD or DVD?
No
Yes
Screenshot
Go Back
Continue

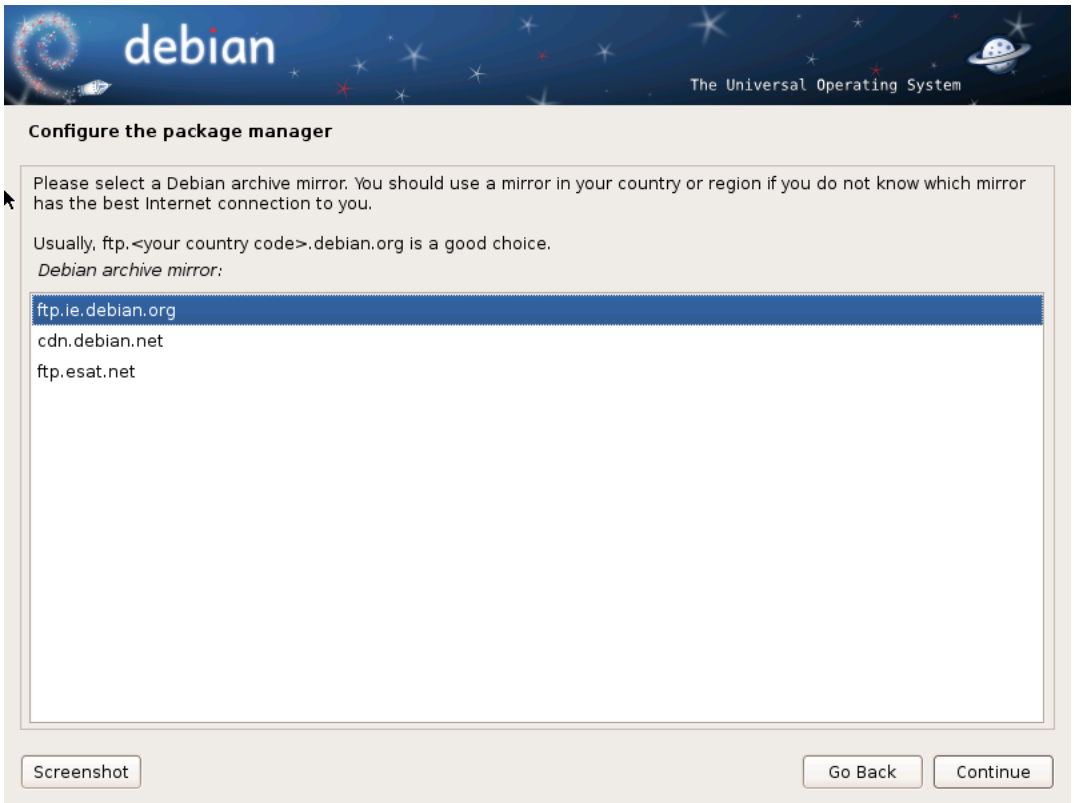
We are then brought to the package manager configuration, where we select "no" for do we want to scan additional CDs for the package manager.


debian
The Universal Operating System
Configure the package manager
A network mirror can be used to supplement the software that is included on the CD-ROM. This may also make newer versions of software available.
You are installing from a CD, which contains a limited selection of packages. Unless you don't have a good Internet connection, use of a mirror is recommended, especially if you plan to install a graphical desktop environment.
Note that using a mirror can result in a large amount of data being downloaded during the next step of the installation.
Use a network mirror?
No
Yes
Screenshot
Go Back
Continue

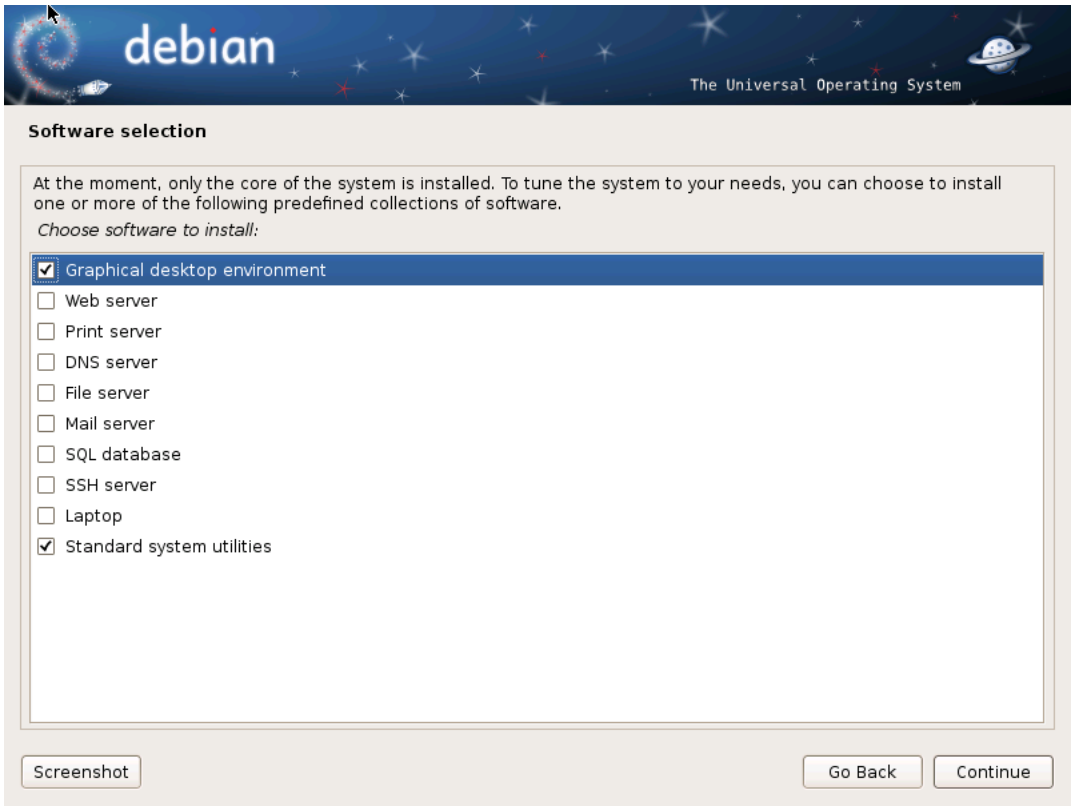
We select "yes" in order to use a network mirror to supplement the software that is included on the ISO from which we are installing the debian operating system.



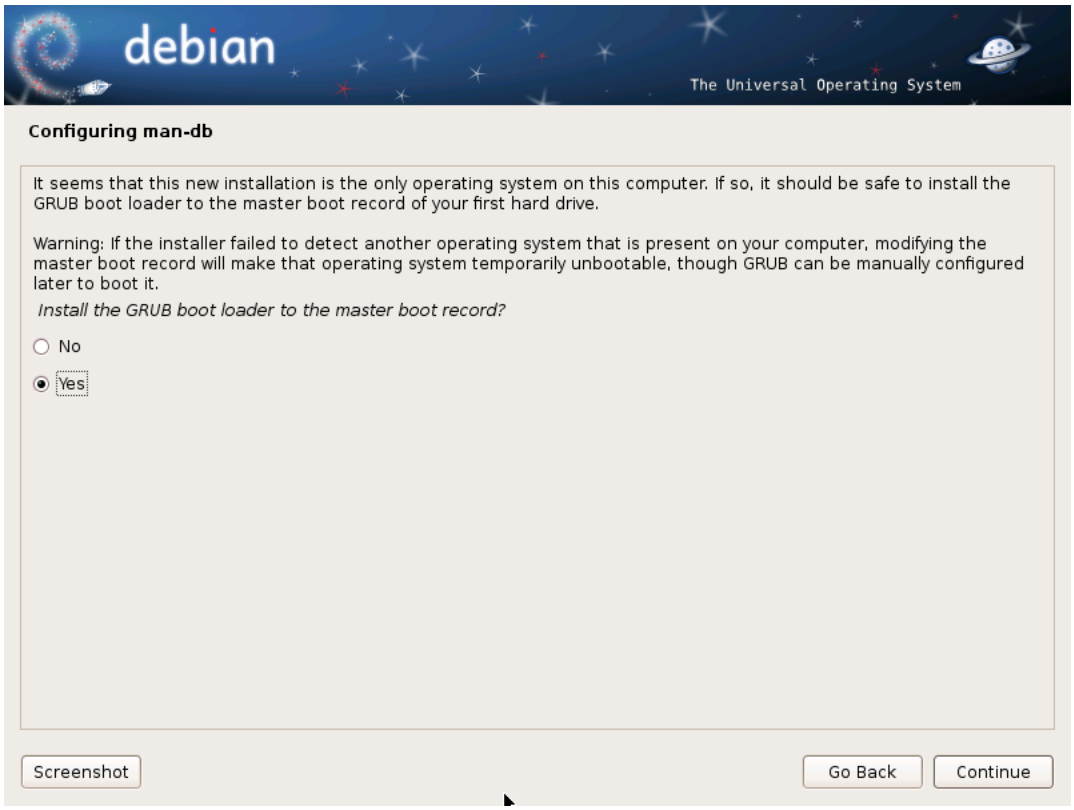

We select Ireland as our country.


debian
The Universal Operating System
Configure the package manager
Please select a Debian archive mirror. You should use a mirror in your country or region if you do not know which mirror has the best Internet connection to you.
Usually, ftp.<your country code>.debian.org is a good choice.
Debian archive mirror:
ftp.ie.debian.org
cdn.debian.net
ftp.esat.net
Screenshot
Go Back
Continue

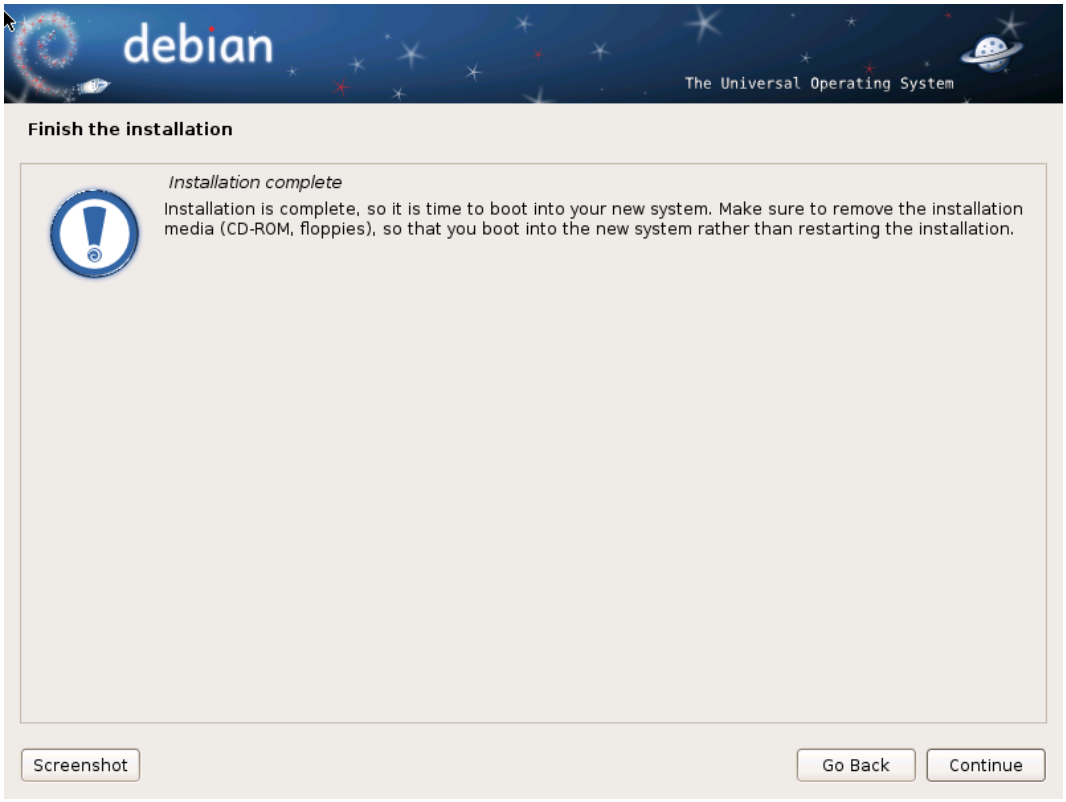
We are presented with a number of mirror options, and we select the ftp.<your country code>.debian.org as recommended by the installer wizard.



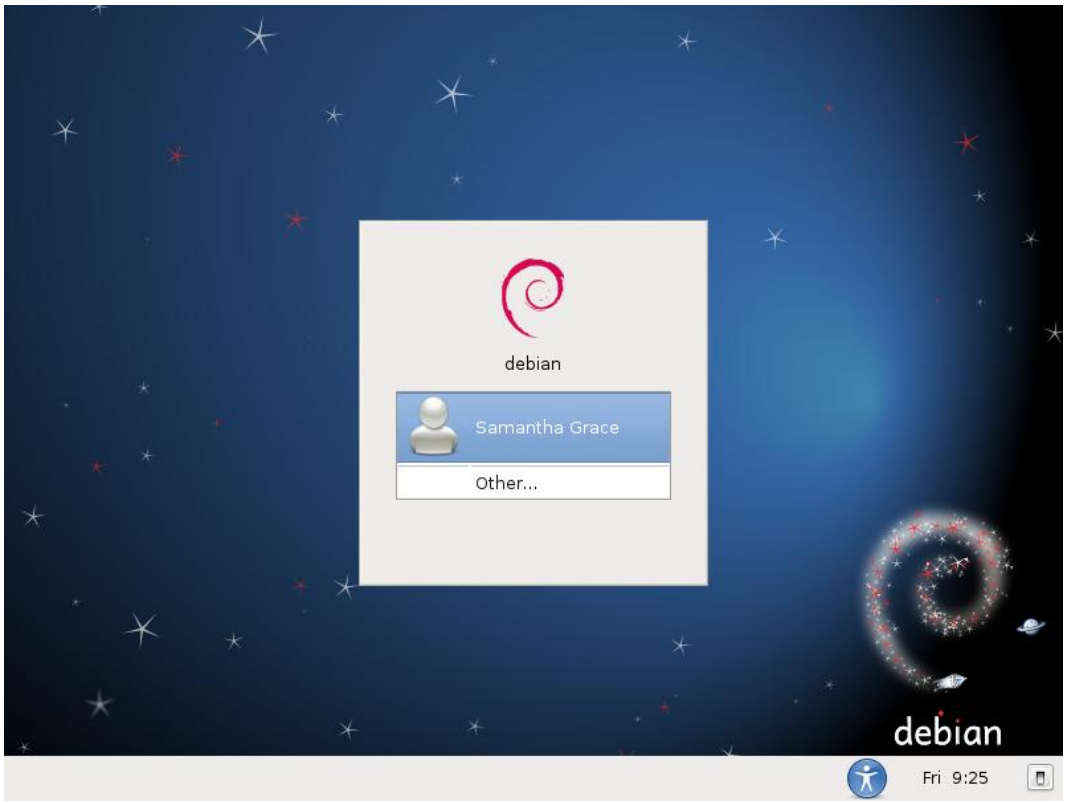

We then select that we wish to install a graphical desktop environment along with standard system utilities.


debian
The Universal Operating System
Configuring man-db
It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.
Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.
Install the GRUB boot loader to the master boot record?
No
Yes
Screenshot
Go Back
Continue

We select yes to install the GRUB boot loader to the boot record.

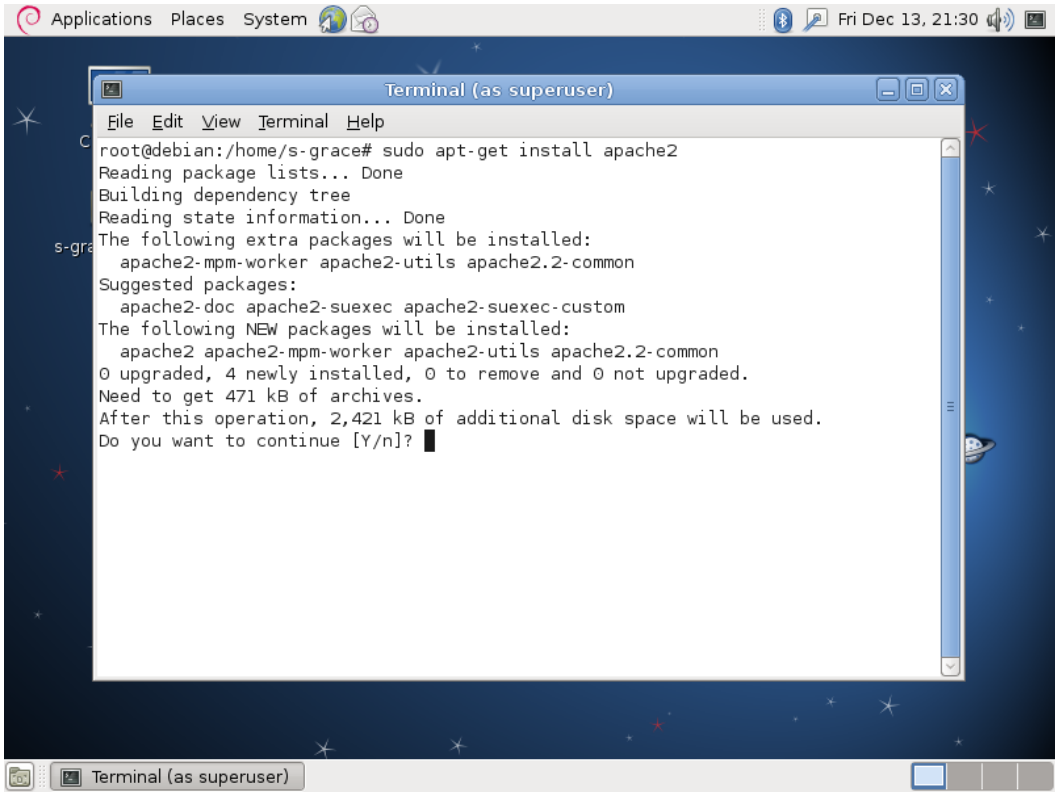

debian
The Universal Operating System
Finish the installation
Installation complete
Installation is complete, so it is time to boot into your new system. Make sure to remove the installation media (CD-ROM, floppies), so that you boot into the new system rather than restarting the installation.
Screenshot
Go Back
Continue

We then receive notification that the installation is complete, and that we are ready to boot into the system, and so we click "continue", and our debian operating system installation boots for the first time.

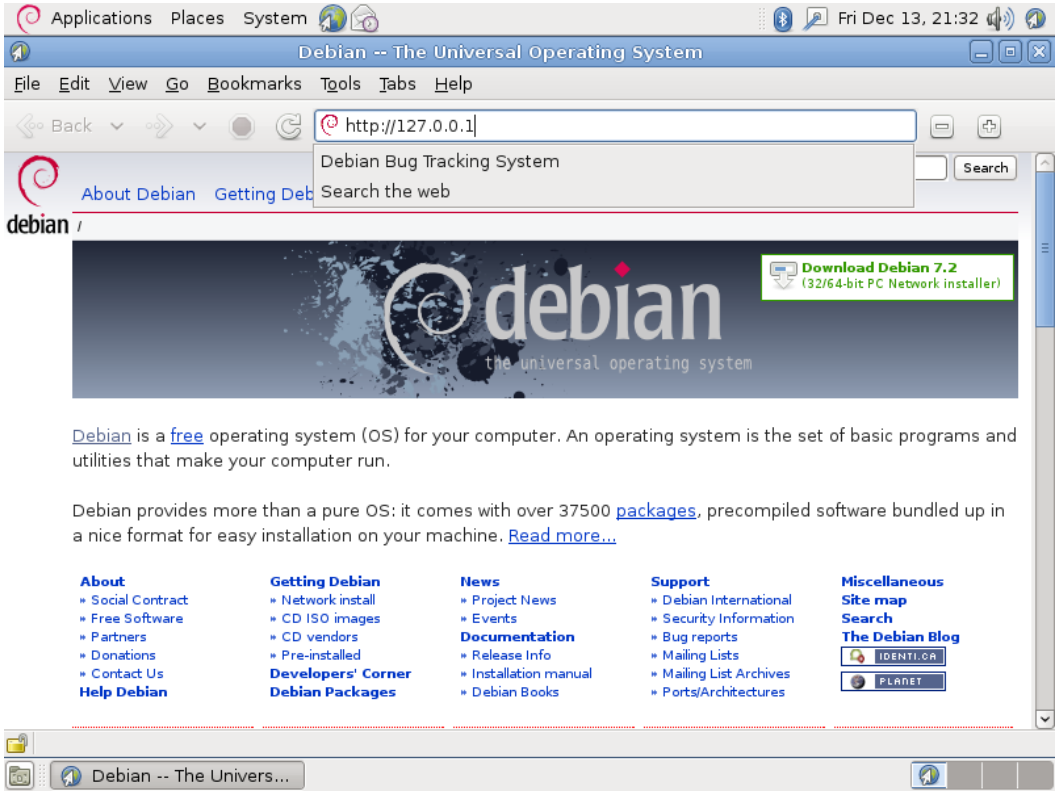



We can now logon as Samantha Grace, the user we earlier created.

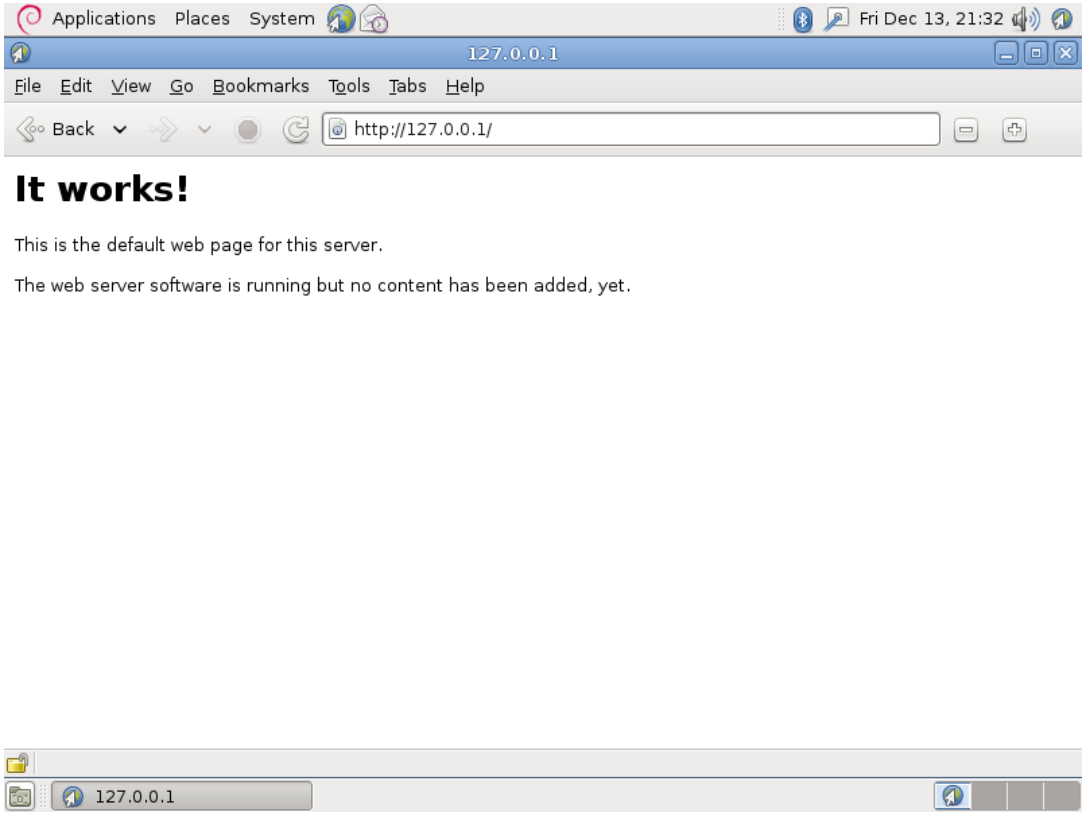
### B.1.3 - Installing the Apache Web-Server on Debian Linux


Applications Places System
Fri Dec 13, 21:30
Terminal (as superuser)
File Edit View Terminal Help
root@debian:/home/s-grace# sudo apt-get install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
apache2-mpm-worker apache2-utils apache2.2-common
Suggested packages:
apache2-doc apache2-suexec apache2-suexec-custom
The following NEW packages will be installed:
apache2 apache2-mpm-worker apache2-utils apache2.2-common
0 upgraded, 4 newly installed, 0 to remove and 0 not upgraded.
Need to get 471 kB of archives.
After this operation, 2,421 kB of additional disk space will be used.
Do you want to continue [Y/n]?
Terminal (as superuser)

On the debian desktop we click "applications" followed by "accessories" and then "root terminal". This opens the above window, where we type "apt-get install apache2" and press enter, then typing "y" when we are asked to confirm.




In order to confirm that the Apache web-server has installed, we click on "applications", followed by "internet and epiphany web browser".

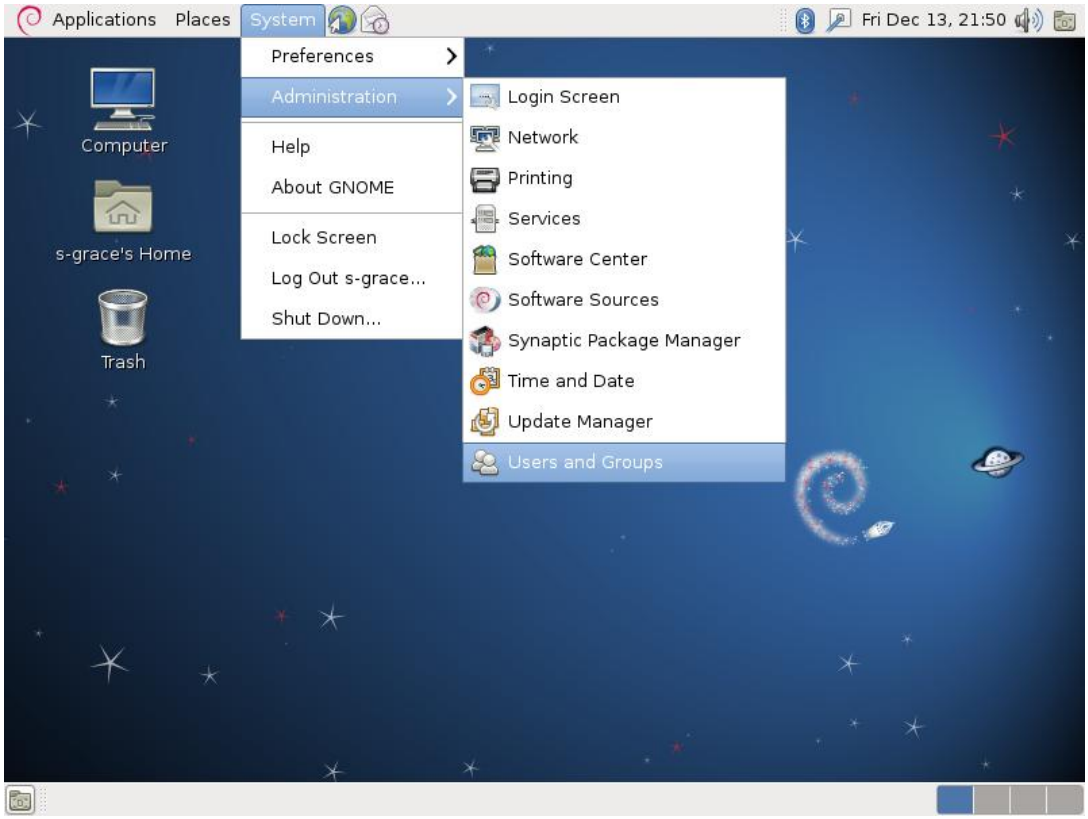



In the address bar we enter http://127.0.0.1 and we see the above window which confirms that the web server has been installed correctly.

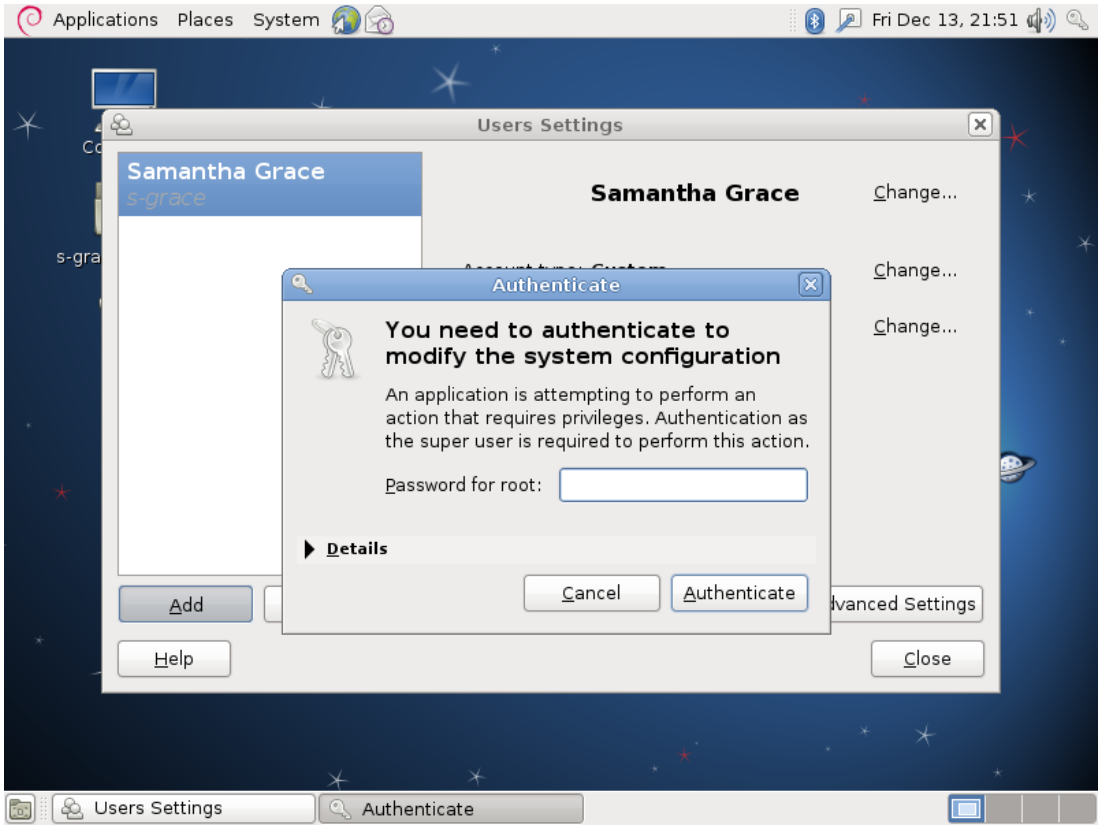
---

## Task B.2 - Create User and User Account Structures

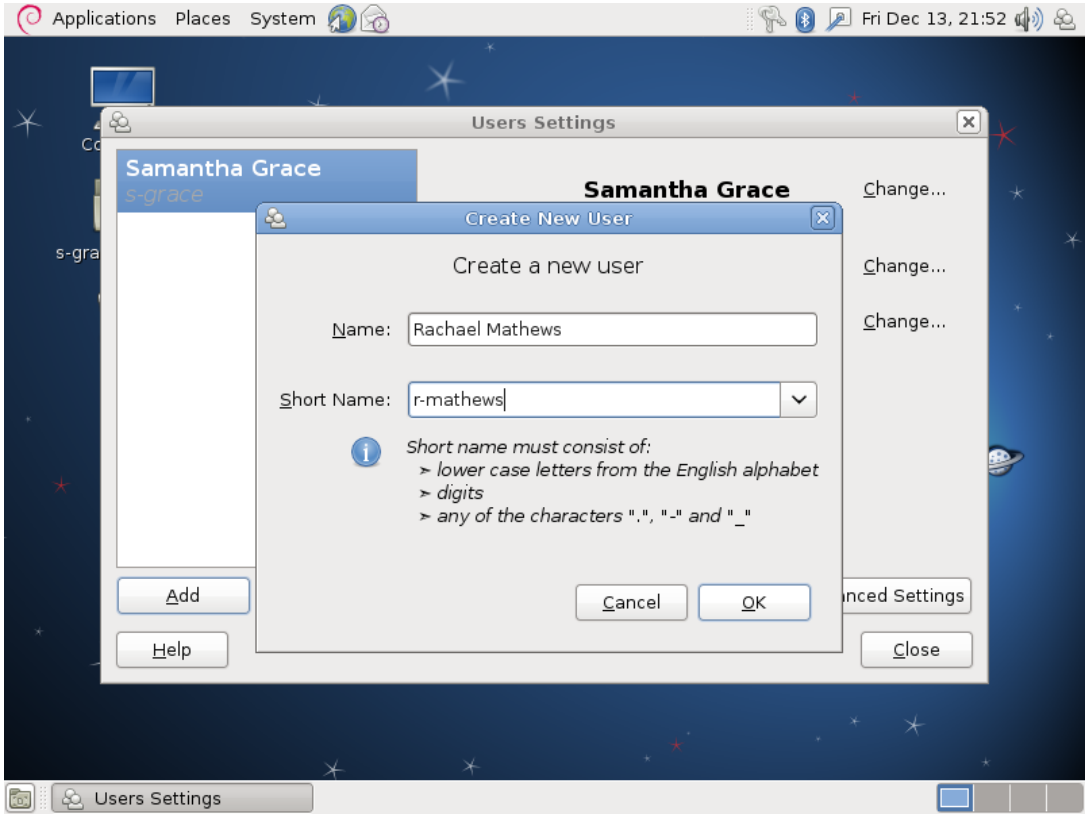
### B.2.1 - Creating Users and User Account Structures



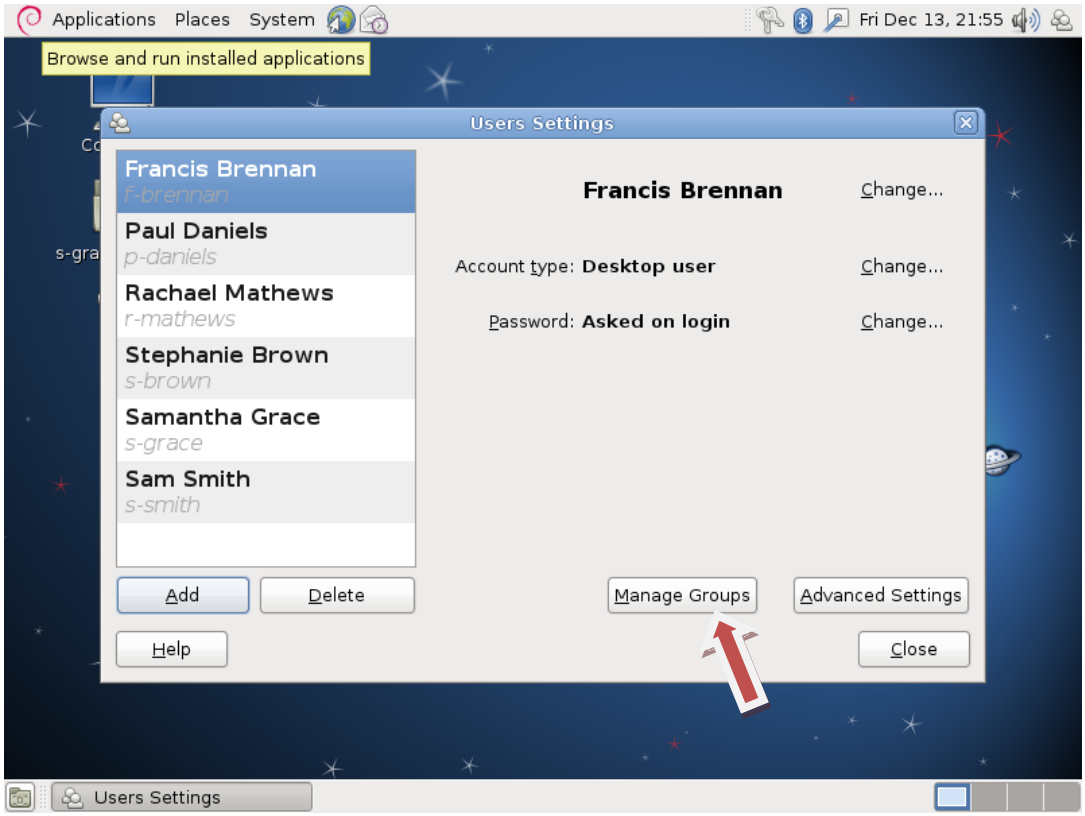

On the debian desktop we click on "system" followed by "administration" followed by "users and groups".



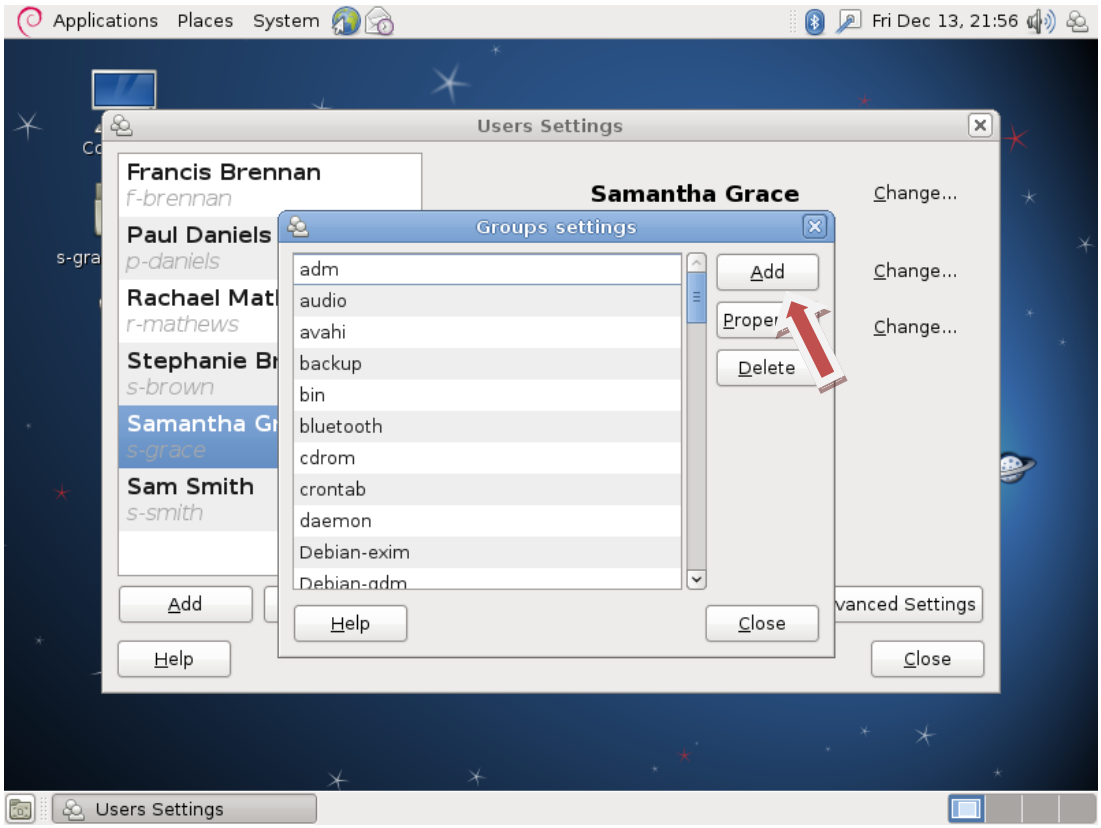

On the users settings page we click "add".



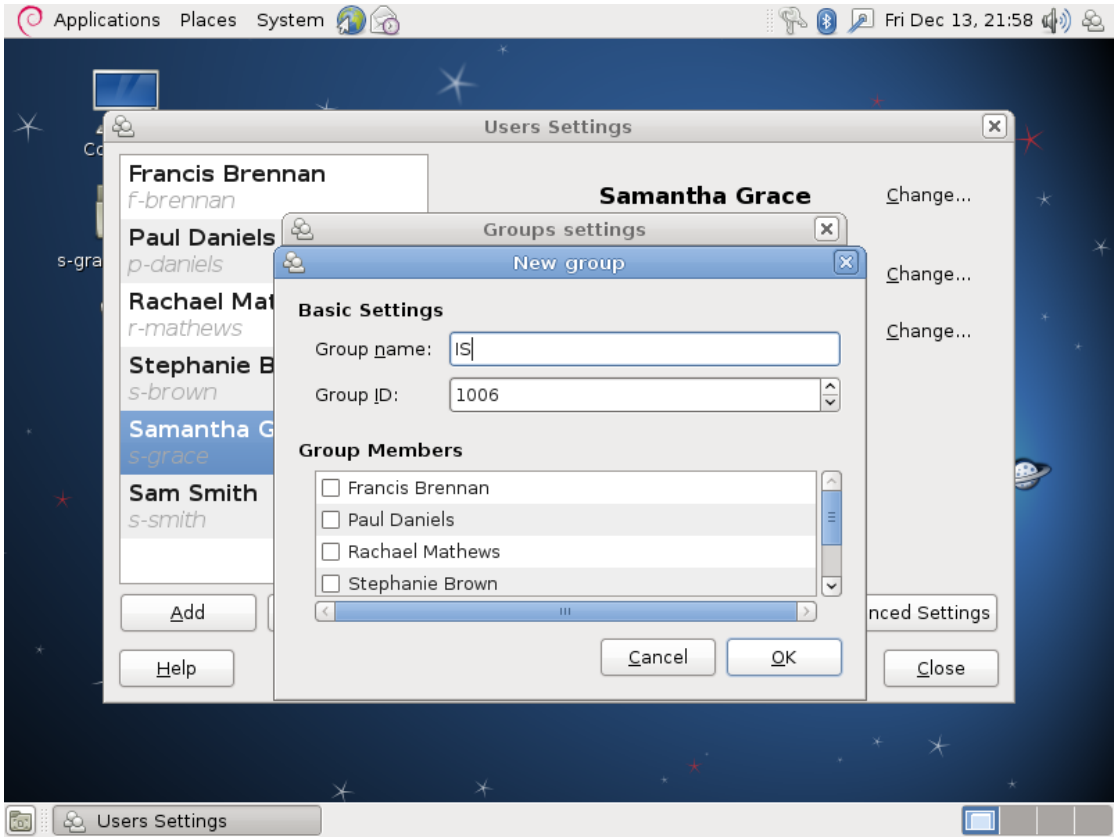

On the create new user page we then enter the name and user name, and on the following page the password, for each of the specified users.



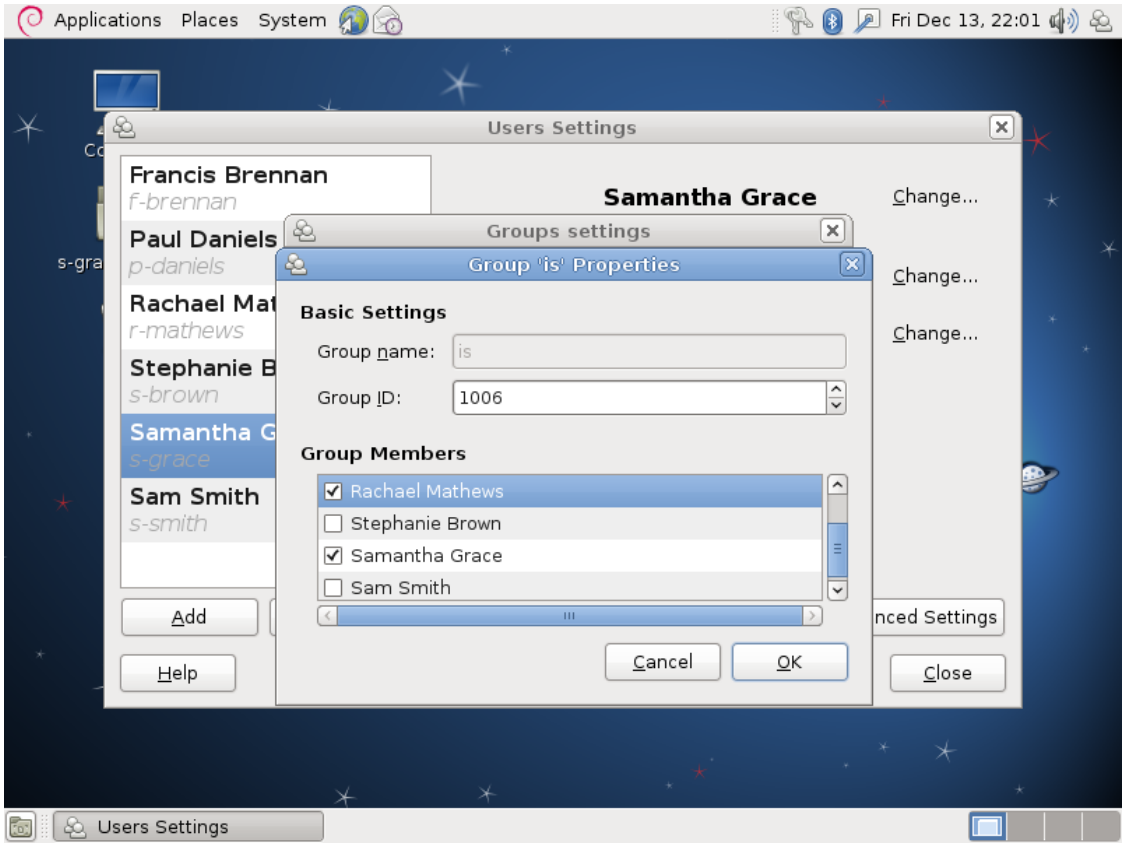

On the user settings screen we then click "manage groups" to create the specified groups.

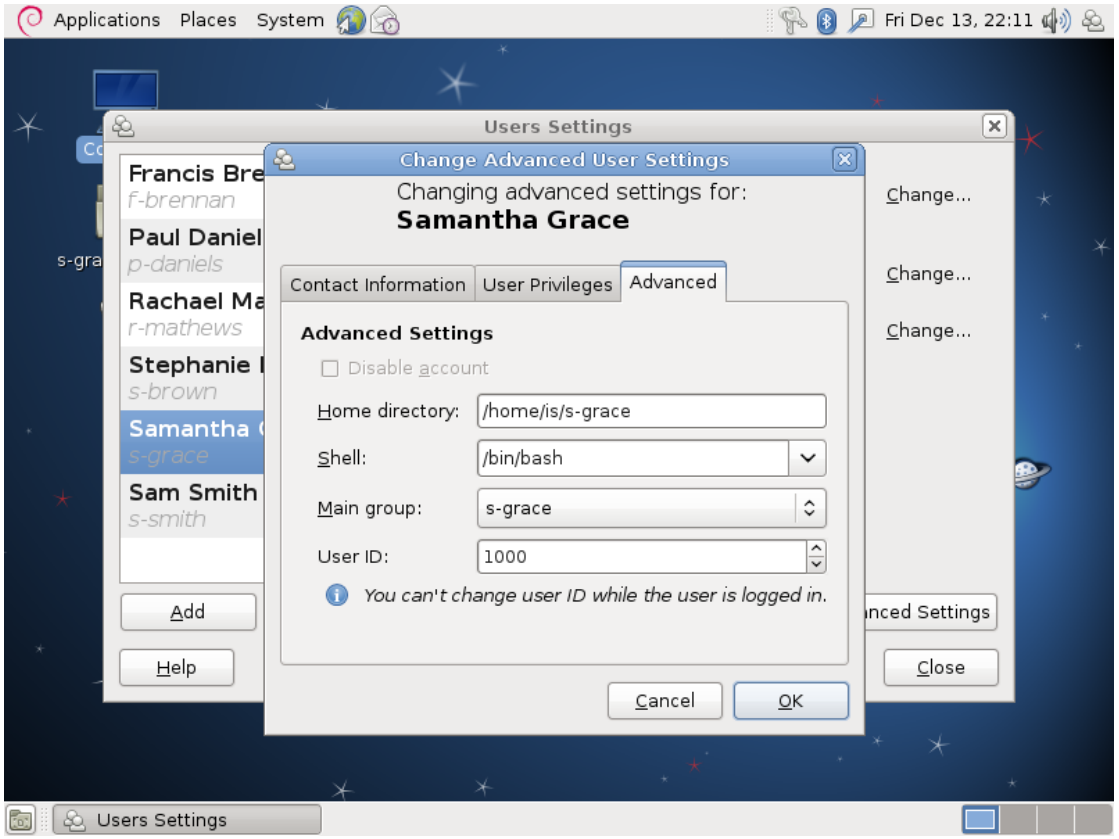



On the groups settings page we click "add".




We can then enter the name of each of the specified groups, and click on the users who are assigned to each group.

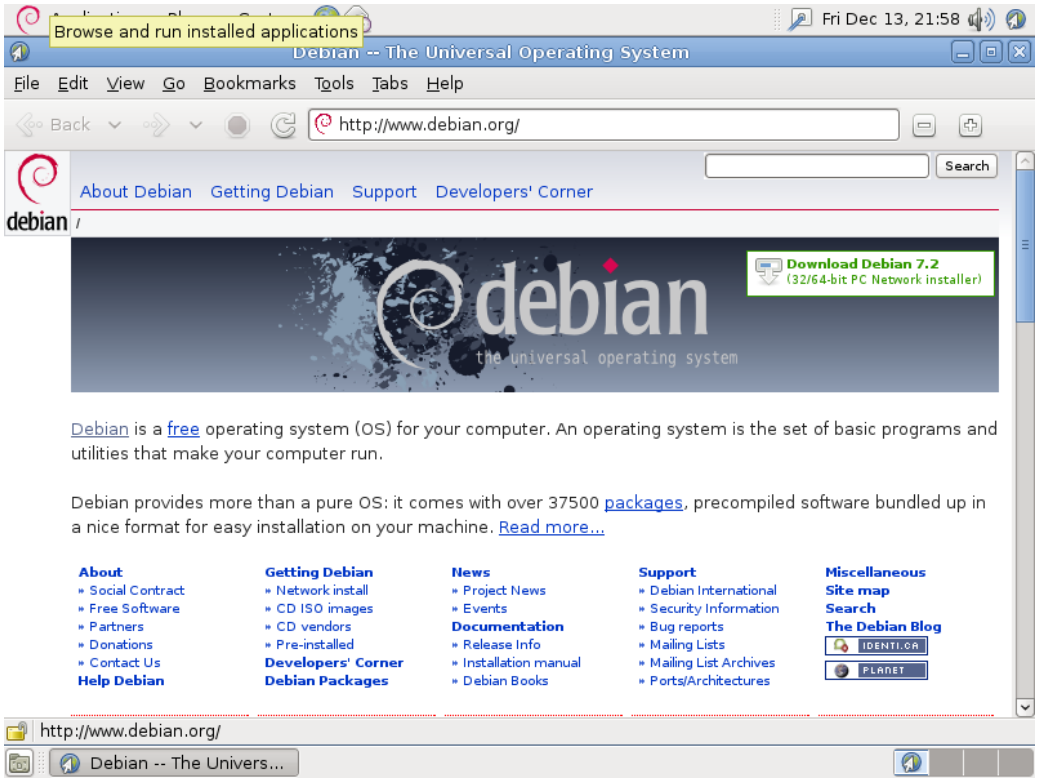


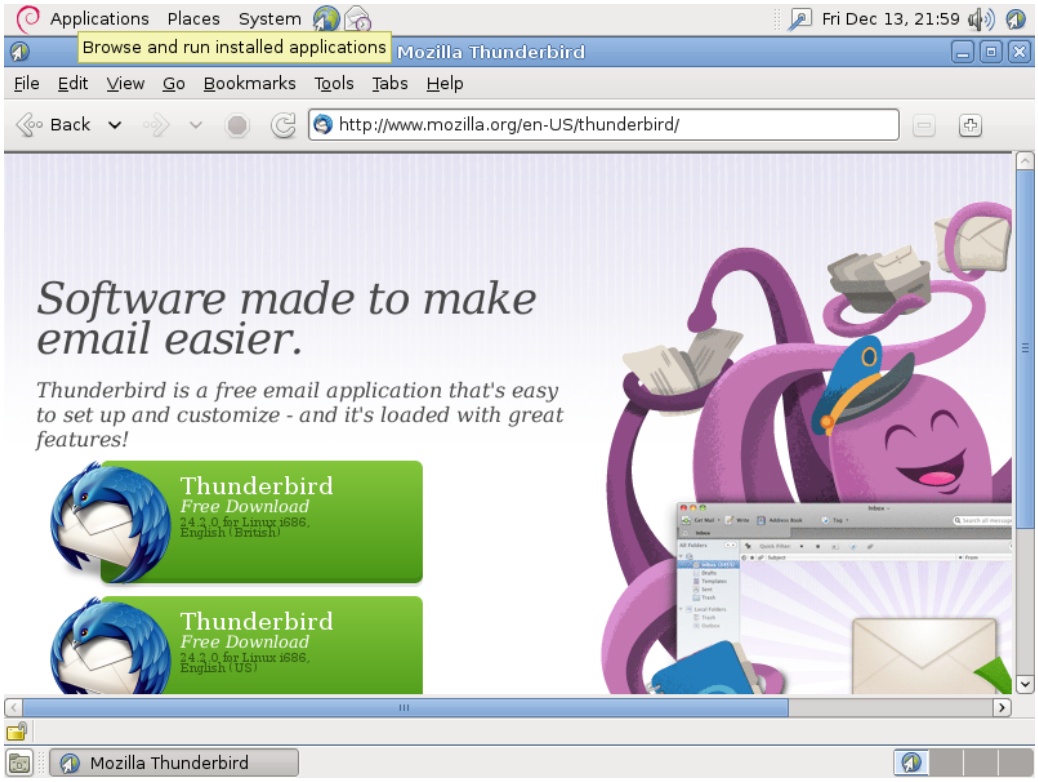

Samantha Grace has already been included in the administrator group as part of our installation of the debian operating system.

## Task B.3 - Installing Open Source Products

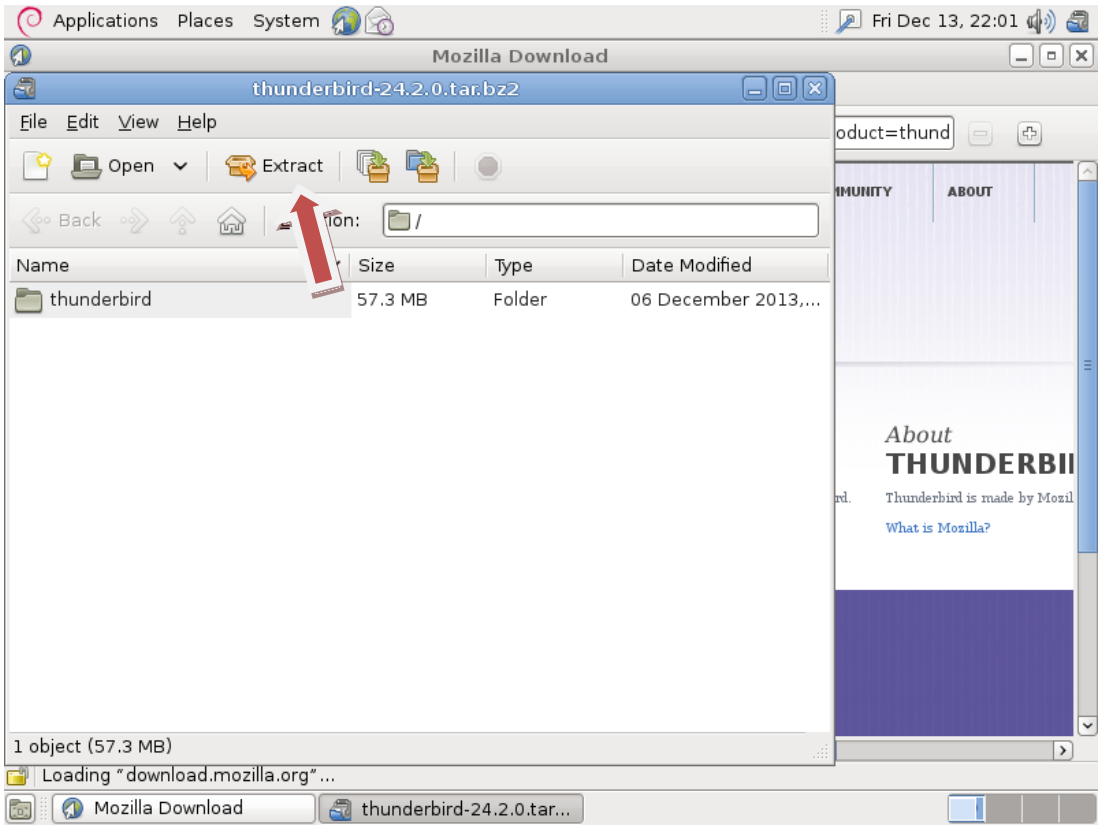
### B.3.1 - Installing Email (Thunderbird)



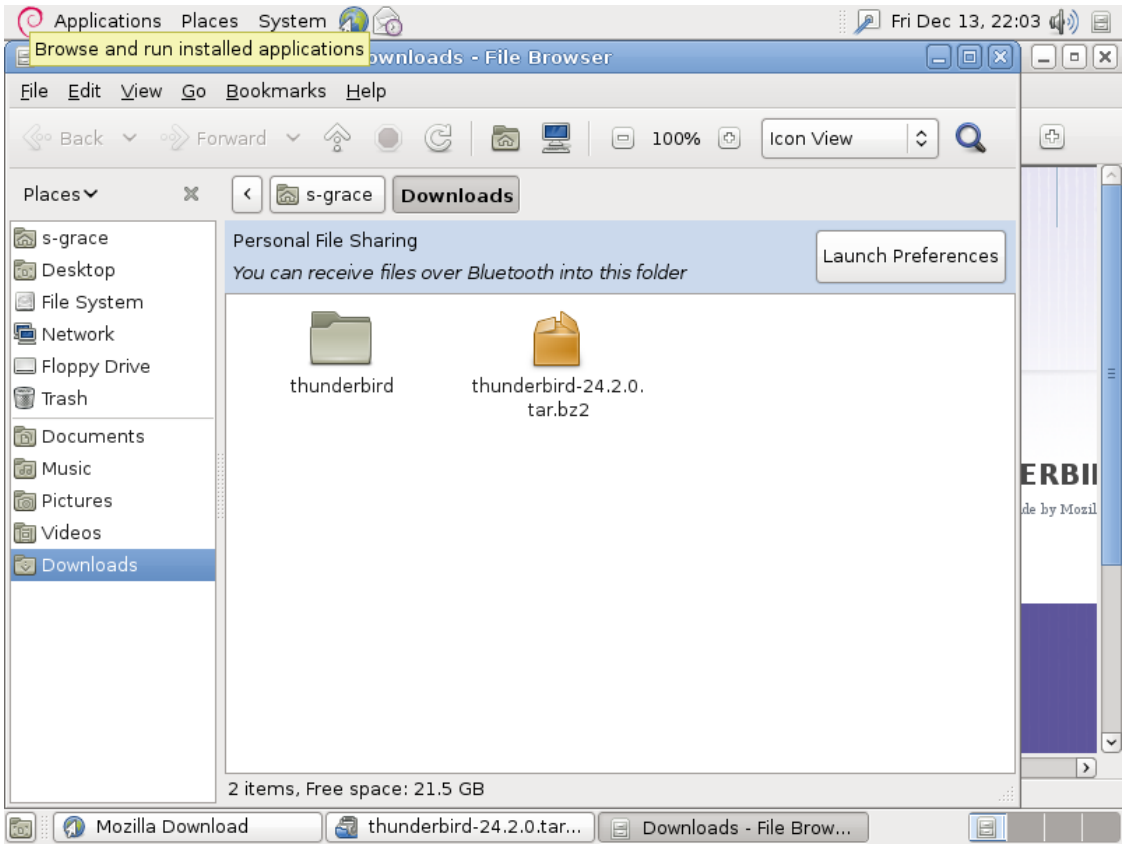

From the debian desktop we click "applications", followed by "internet and epiphany web browser".


Applications Places System
Fri Dec 13, 21:59
Browse and run installed applications
Mozilla Thunderbird
File Edit View Go Bookmarks Tools Tabs Help
Back
http://www.mozilla.org/en-US/thunderbird/
Software made to make email easier.
Thunderbird is a free email application that's easy to set up and customize - and it's loaded with great features!
Thunderbird
Free Download
24.2.0 for Linux i686, English (British)
Thunderbird
Free Download
24.2.0 for Linux i686, English (US)
Mozilla Thunderbird

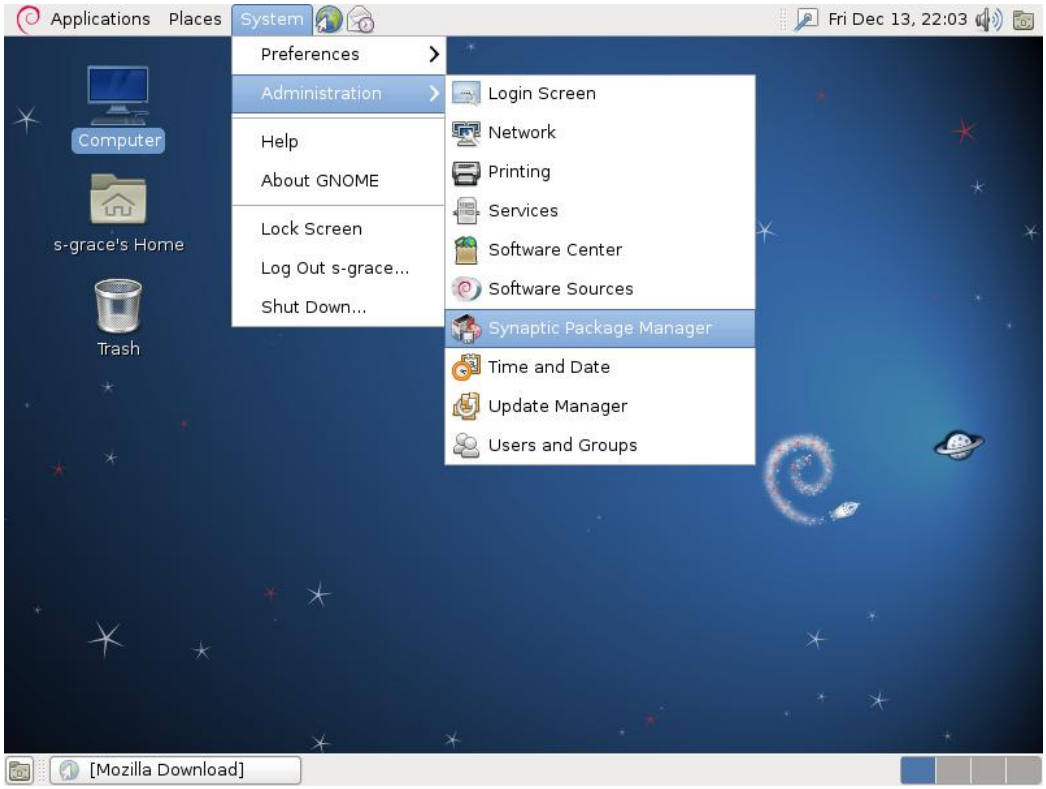
We then navigate to www.getthunderbird.com by typing this address into the address bar, where we click on the "free download for Linux English (British).



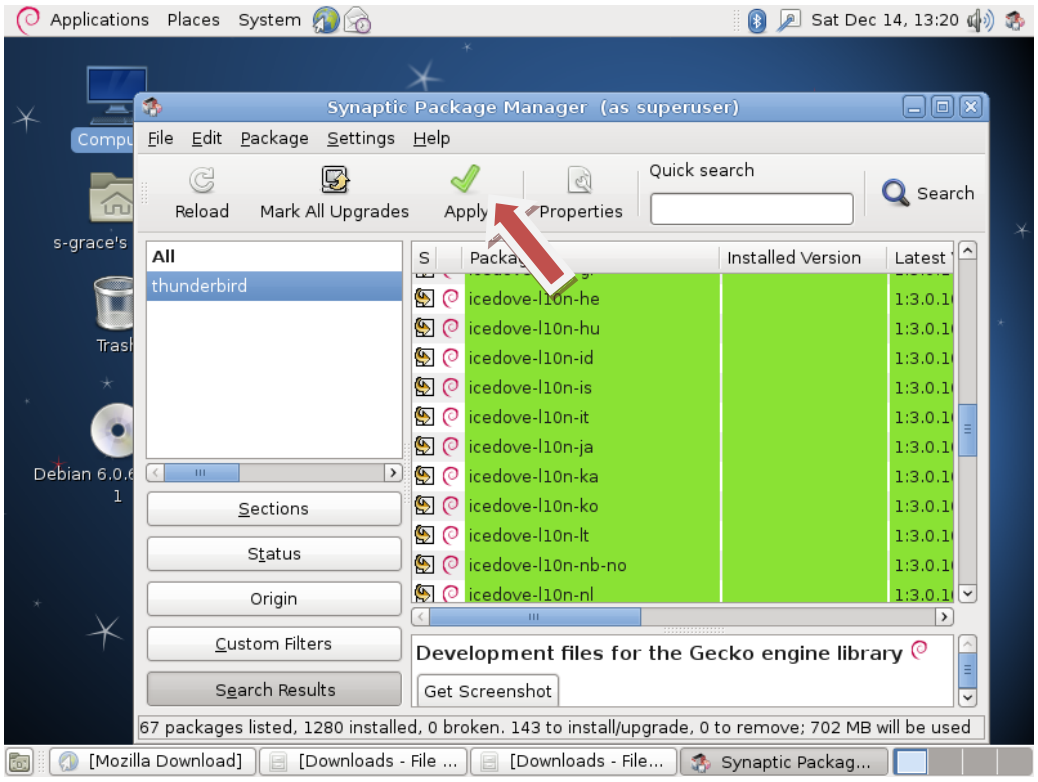

Once the download has completed we extract it by clicking on "computer" from the desktop followed by "downloads". We then double click on the "thunderbird" folder, and when it opens we highlight it and click on "extract".



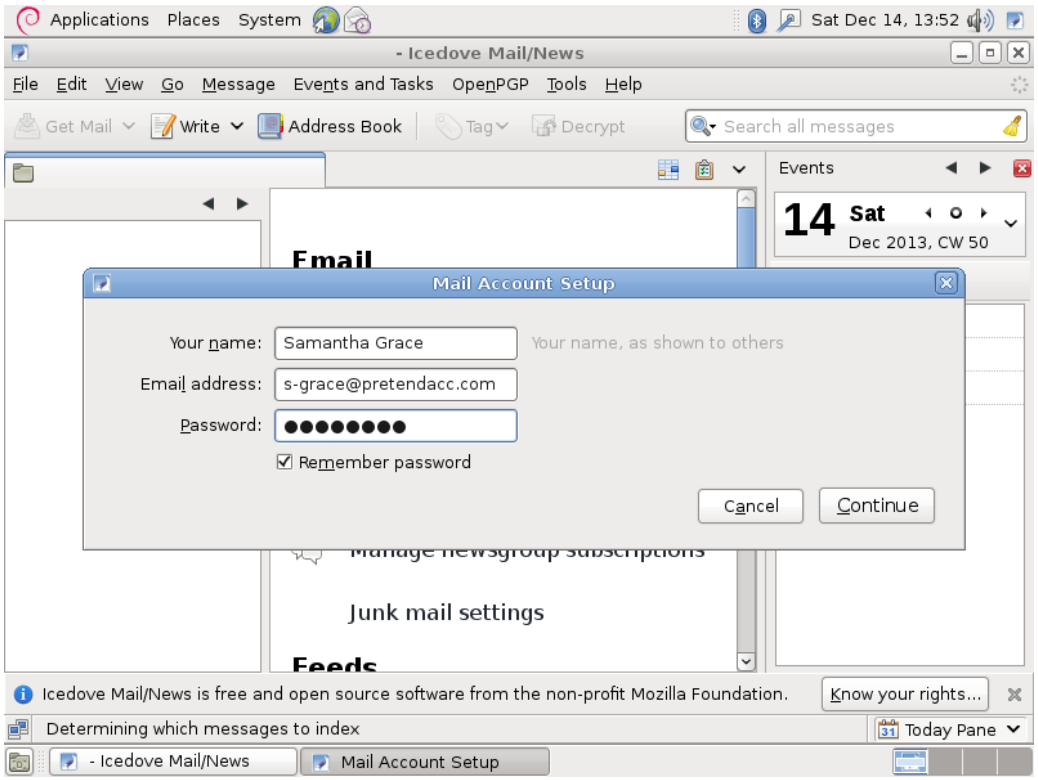

We then navigate back to the downloads folder where there is now a second thunderbird folder which is the extracted version.




Software on the debian operating system is installed in packages, therefore from the desktop we click on "system" followed by "administrator" followed by the "synaptic package manager".




We then enter "thunderbird" into the search field which locates the downloaded thunderbird folder, and we select all of the "icedove" files to be installed, and then click "apply".




Thunderbird is now available on our system and we can set up an email account for Samantha Grace.

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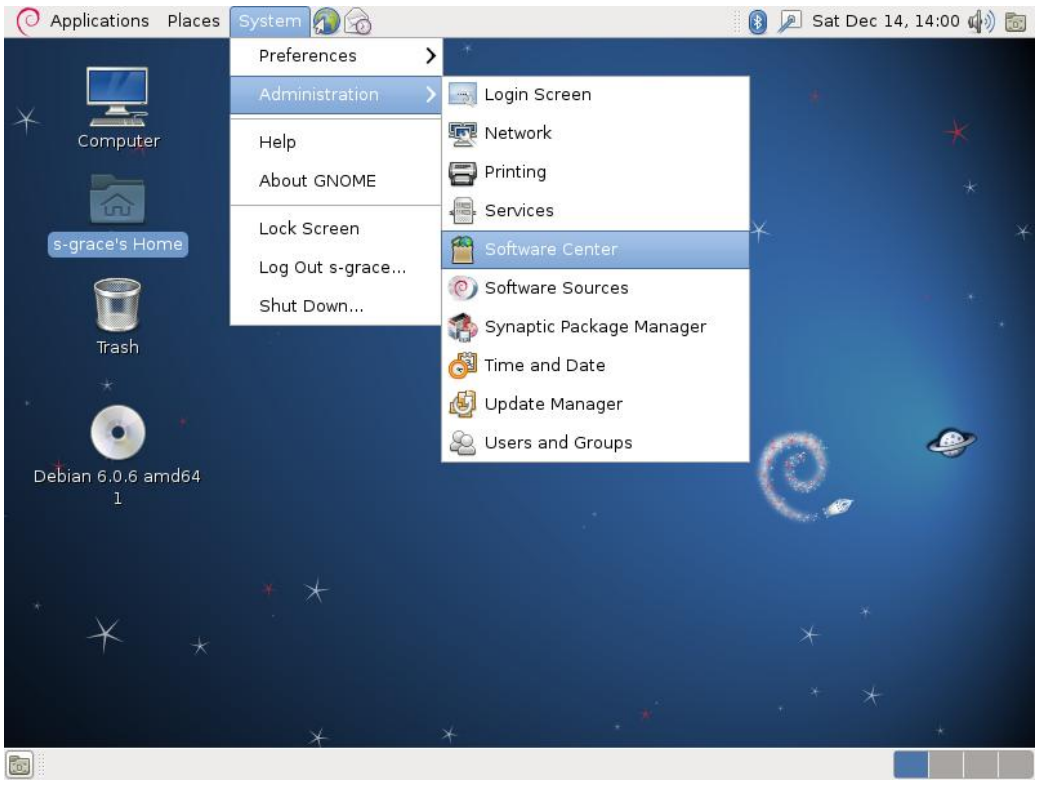
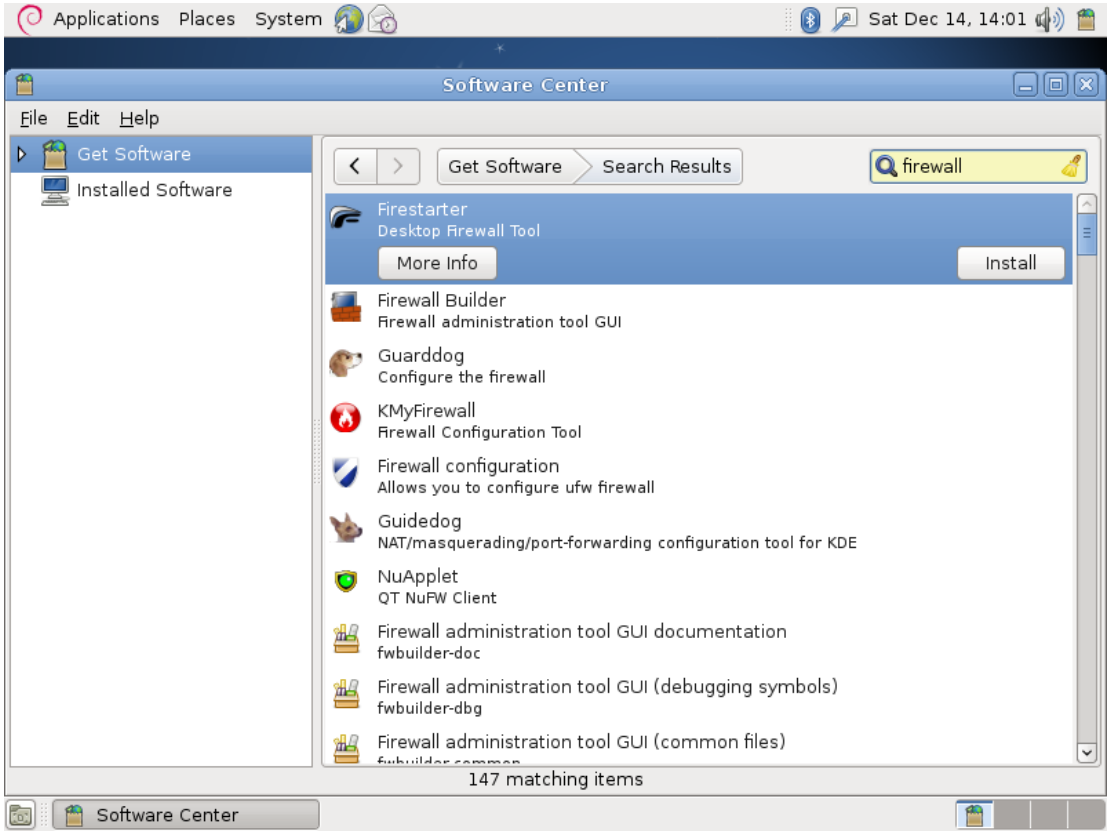
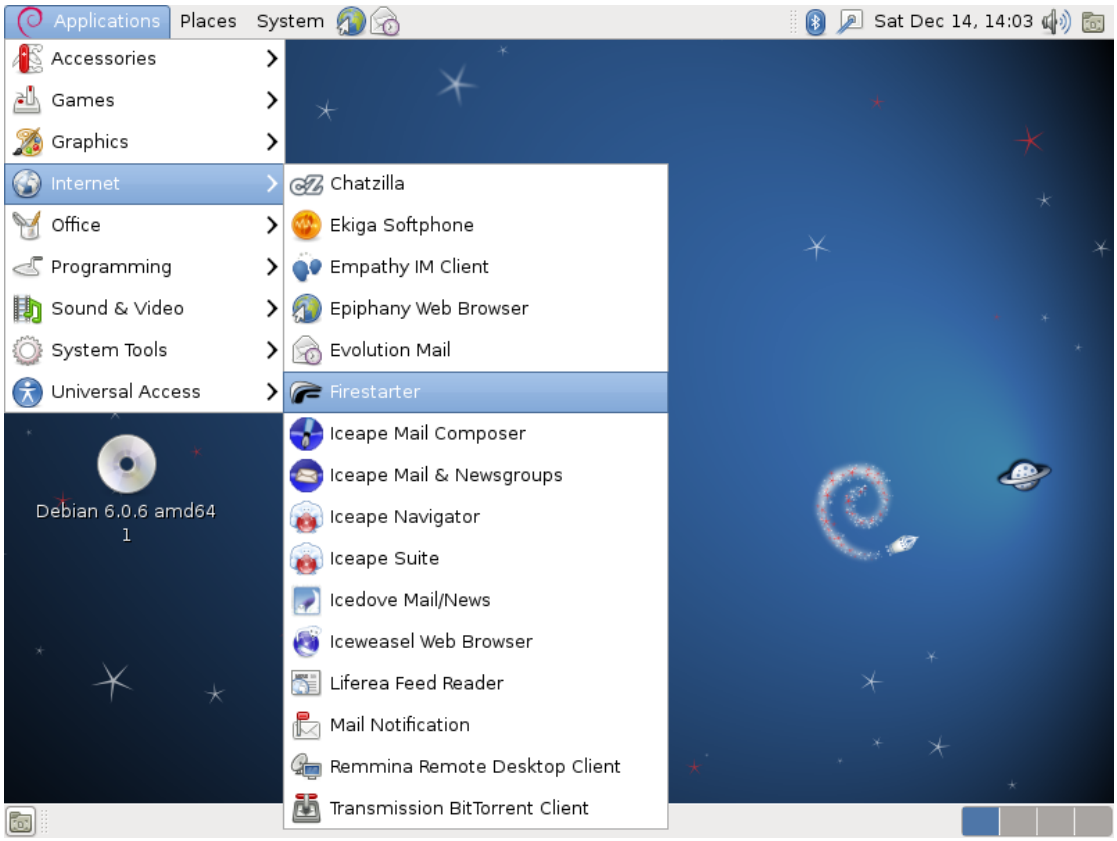
### B.3.2 - Firewall




The software centre in debian linux contains free software for debian linux machines, and is accessed from the desktop by clicking "system", followed by "administration" followed by "software centre".




Once in the software centre we run a search for "firewall". In the search results we select "firestarter" and click "install".




The firewall is then installed and is found in "applications" and then "internet".

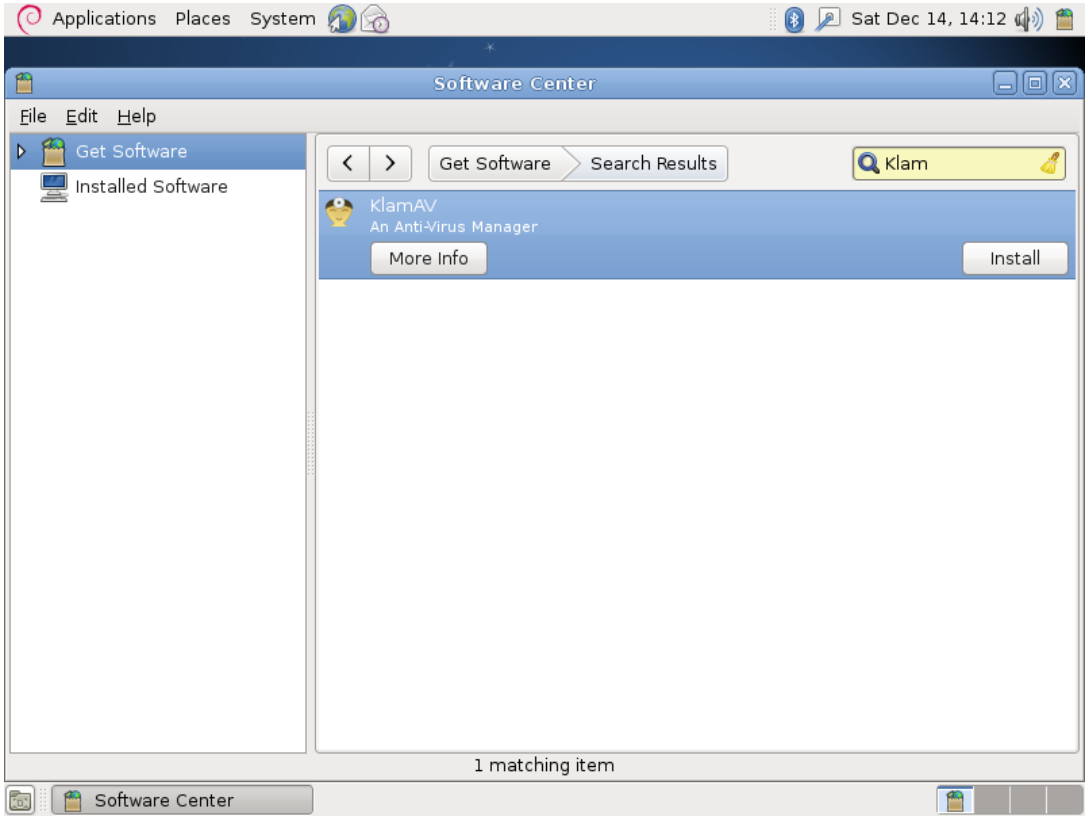
Applications
Places
System
Sat Dec 14, 14:04
Firewall Wizard (as superuser)
FIRESTARTER
Welcome to Firestarter
This wizard will help you to set up a firewall for your Linux machine. You will be asked some questions about your network setup in order to customize the firewall for your system.
Tip: If you are uncertain of how to answer a question it is best to use the default value supplied.
Please press the forward button to continue.
Back
Forward
Save
Quit
Firewall Wizard (as sup...

When we open Firestarter we click "forward" to start the process, and select Ethernet as our internet connection type and click save. The firewall is then active.

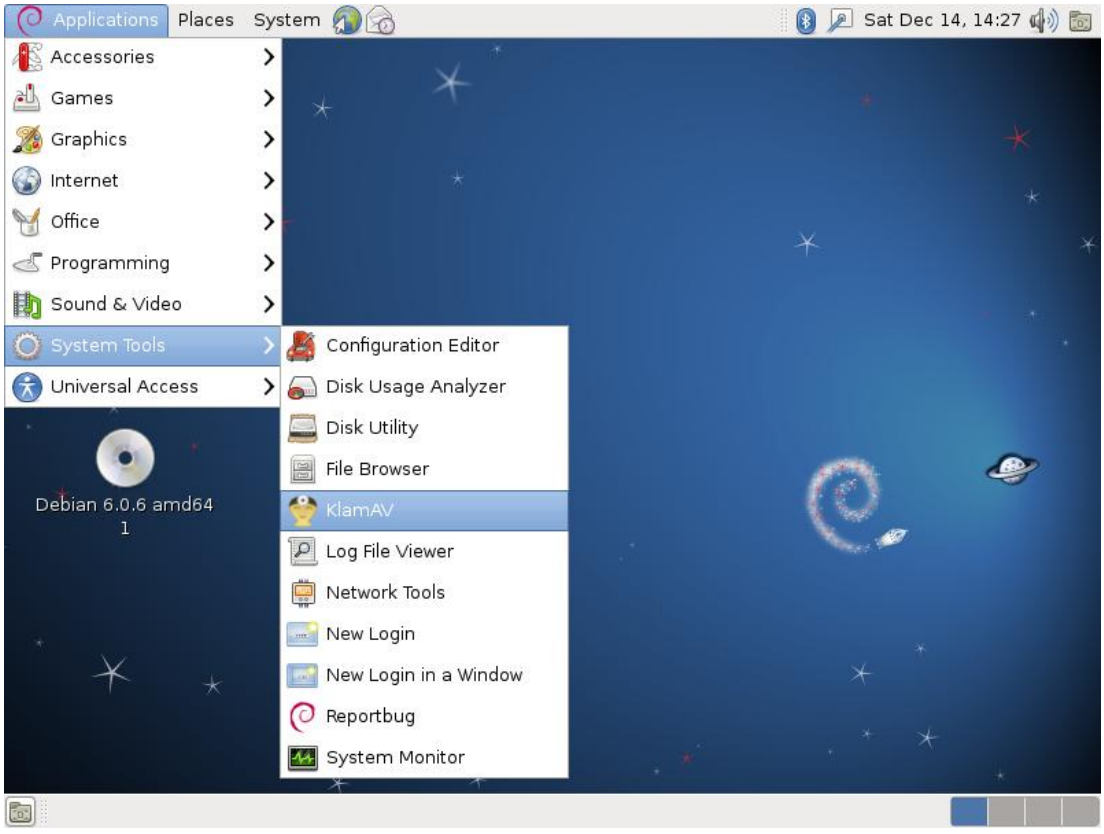
### B.3.3 - Anti Virus

The next step is to find an open source anti virus package.

The process is the same as with the firewall, we click "system", "administration" and "software centre".



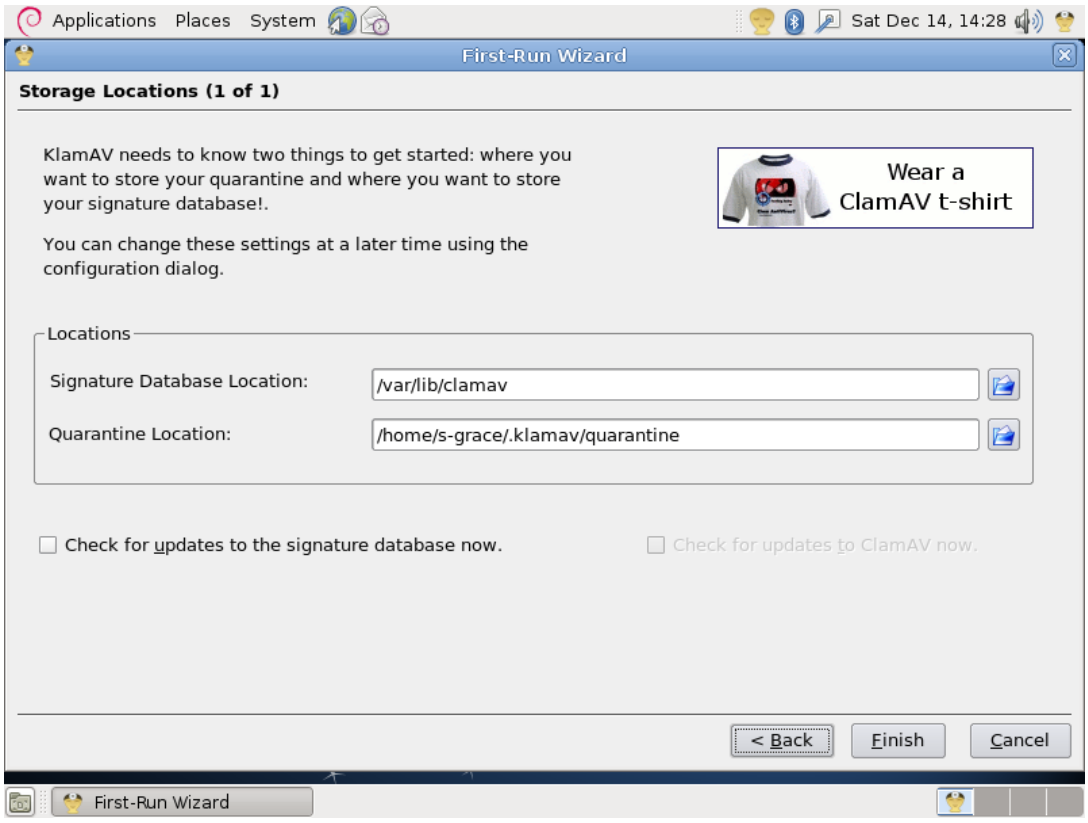

Once in the software centre, we then run a search for KlamAV, and once located, we click on "install" to install the anti virus software.



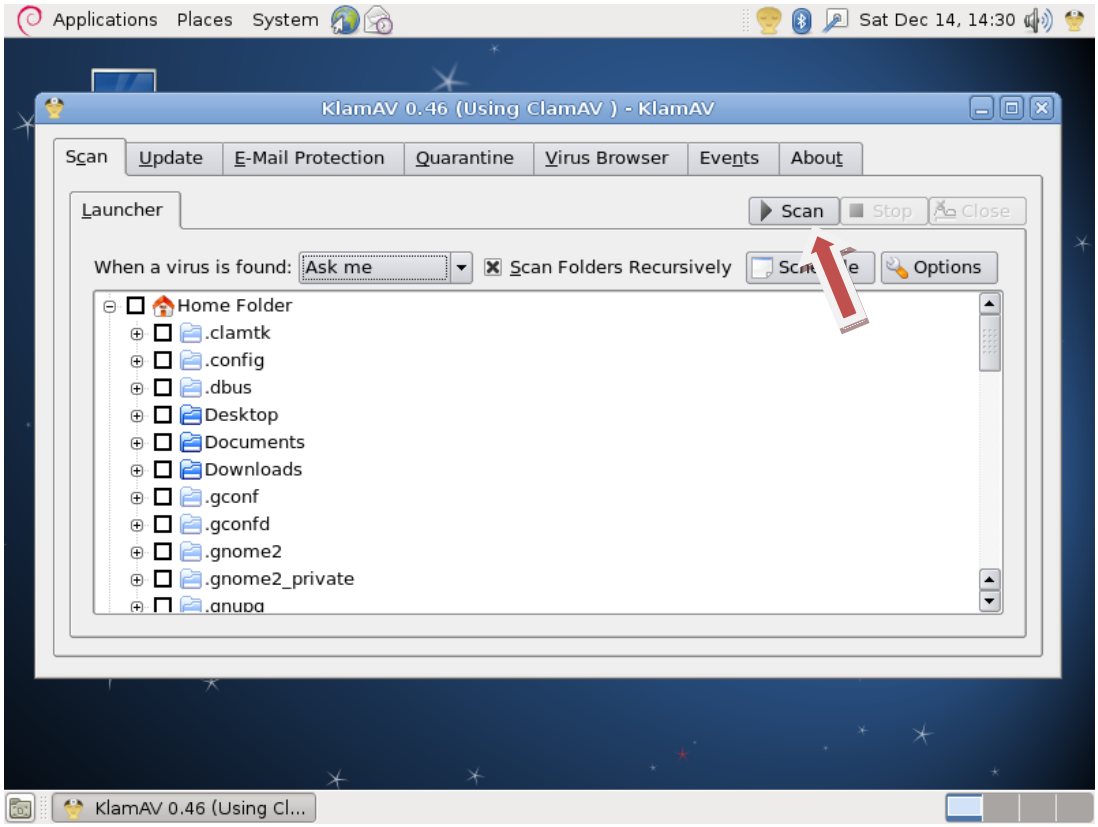

Once it has installed, the software can be accessed from the desktop through "applications", in "system tools".

Browse and run installed applications
Sat Dec 14, 14:28
First-Run Wizard
Welcome to KlamAV!
KlamAV aims to be easy and intuitive to use. Before you can get started though, you need to tell it where you want to store a couple of things.
"KlamAV is beta software!" - The Author
What is ClamAV?
ClamAV is signature-based virus and malware detection software with a world-class updates infrastructure and a rapid development cycle.
What is KlamAV?
KlamAV is an anti-virus manager for the KDE desktop that allows you to manage your virus-scanning, scheduling, virus research and software/database updates. In other words, it's a front-end.
This wizard will help you setup KlamAV in one simple step. Click Next to begin, or if you do not like wizards, click Skip.
< Back
Next >
Skip
First-Run Wizard

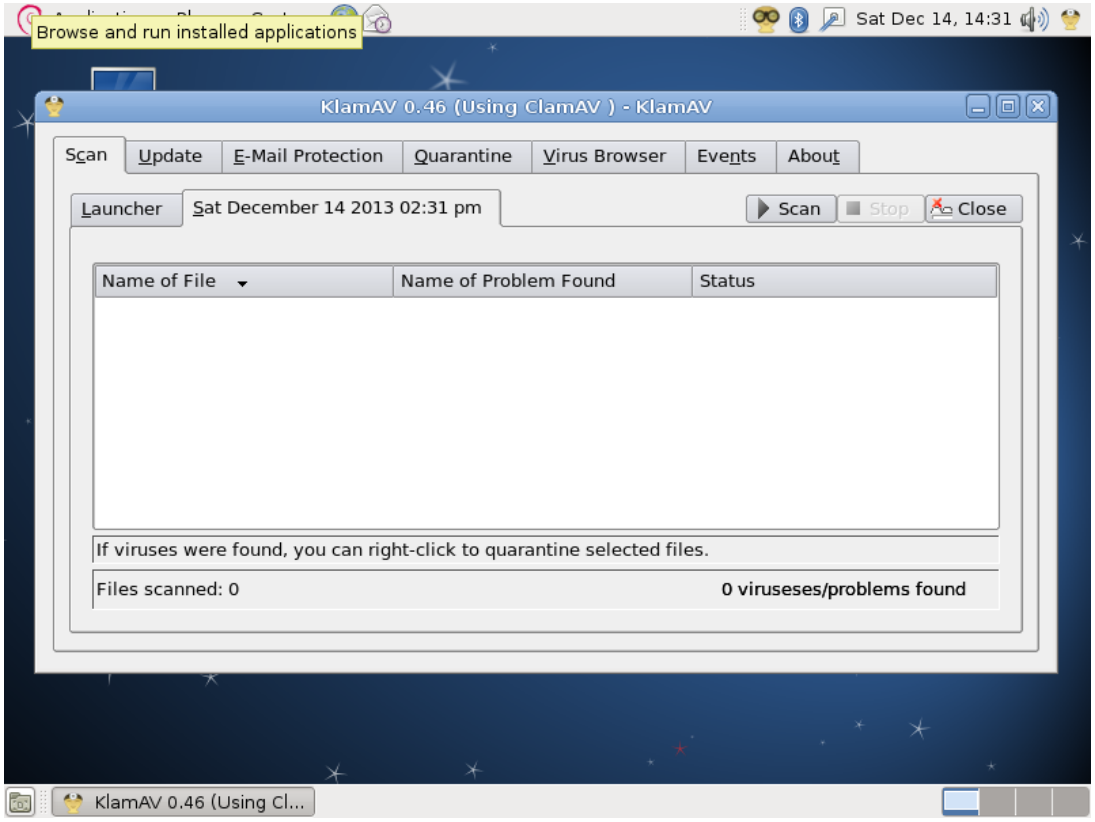
When we first open KlamAV we enter the first-run wizard and we click on "next" to set it up.


Applications
Places
System
Sat Dec 14, 14:28
First-Run Wizard
Storage Locations (1 of 1)
KlamAV needs to know two things to get started: where you want to store your quarantine and where you want to store your signature database!.
You can change these settings at a later time using the configuration dialog.
Wear a ClamAV t-shirt
Locations
Signature Database Location:
/var/lib/clamav
Quarantine Location:
/home/s-grace/.klamav/quarantine
Check for updates to the signature database now.
Check for updates to ClamAV now.
< Back
Finish
Cancel
First-Run Wizard

Klam AV now wants to know where we want quarantined files to be kept, either choose a location or leave the default and click finish to complete the Klam AV setup process.




We click on "scan" to run an initial scan.

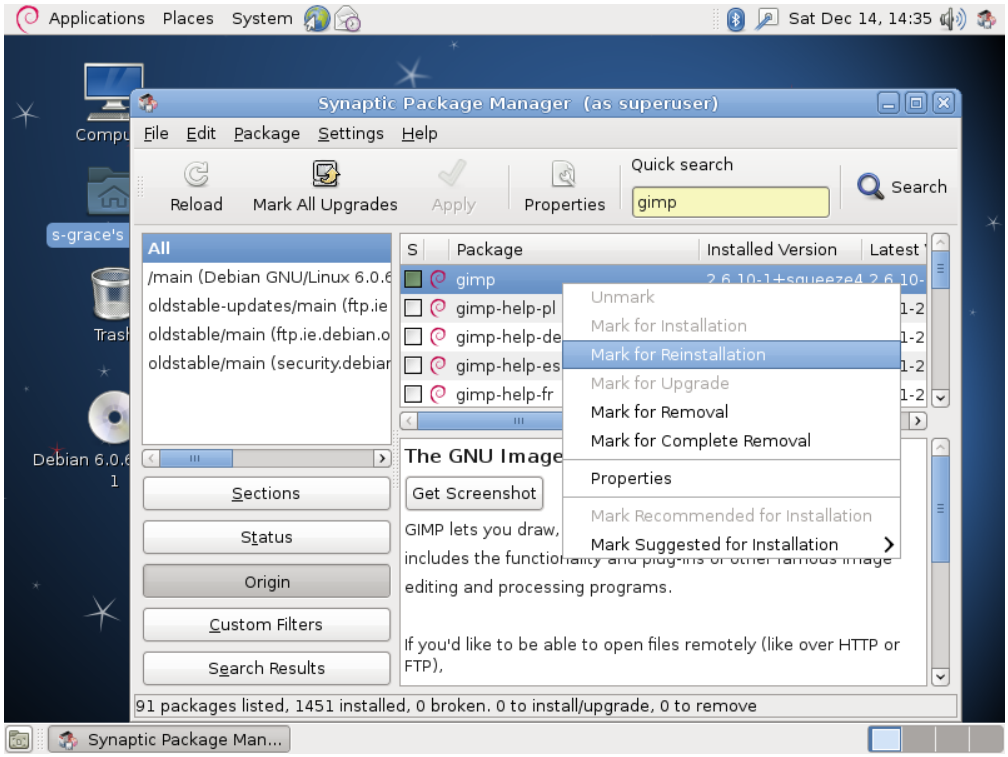

Browse and run installed applications
Sat Dec 14, 14:31
KlamAV 0.46 (Using ClamAV ) - KlamAV
Scan Update E-Mail Protection Quarantine Virus Browser Events About
Launcher
Sat December 14 2013 02:31 pm
Scan Stop Close
Name of File
Name of Problem Found
Status
If viruses were found, you can right-click to quarantine selected files.
Files scanned: 0
0 viruseses/problems found
KlamAV 0.46 (Using Cl...

The scan results window advises that no viruses or problems have been found.

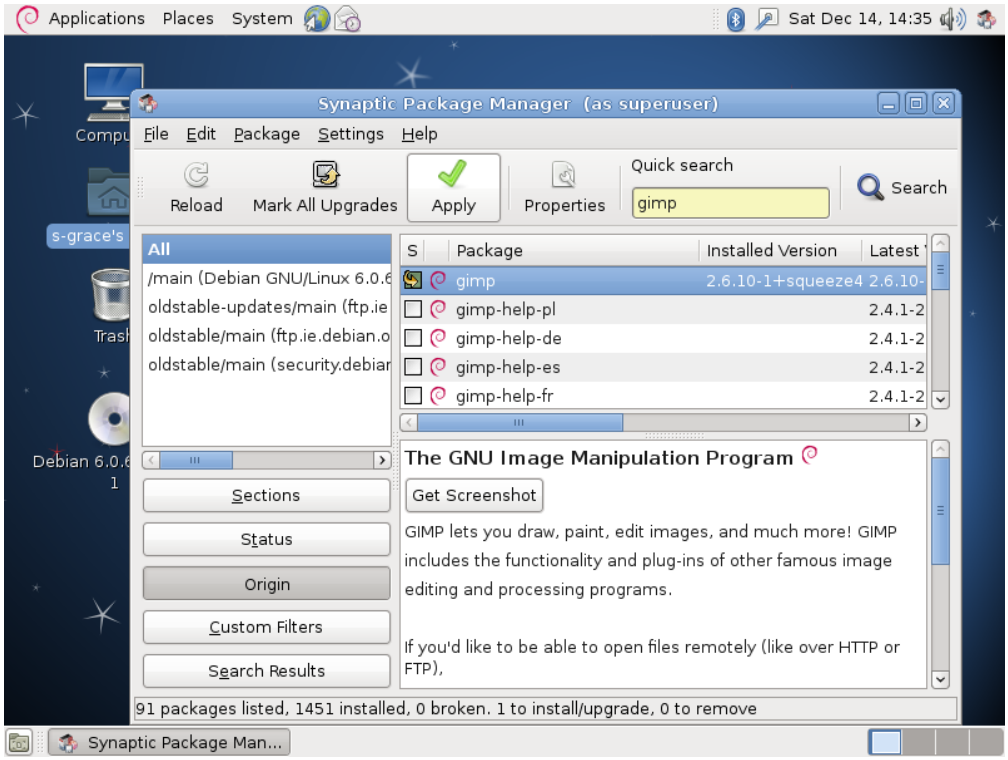
### B.3.4 - Graphics and Image Editing Package

The final open source product that we require is a graphics and image editing package.

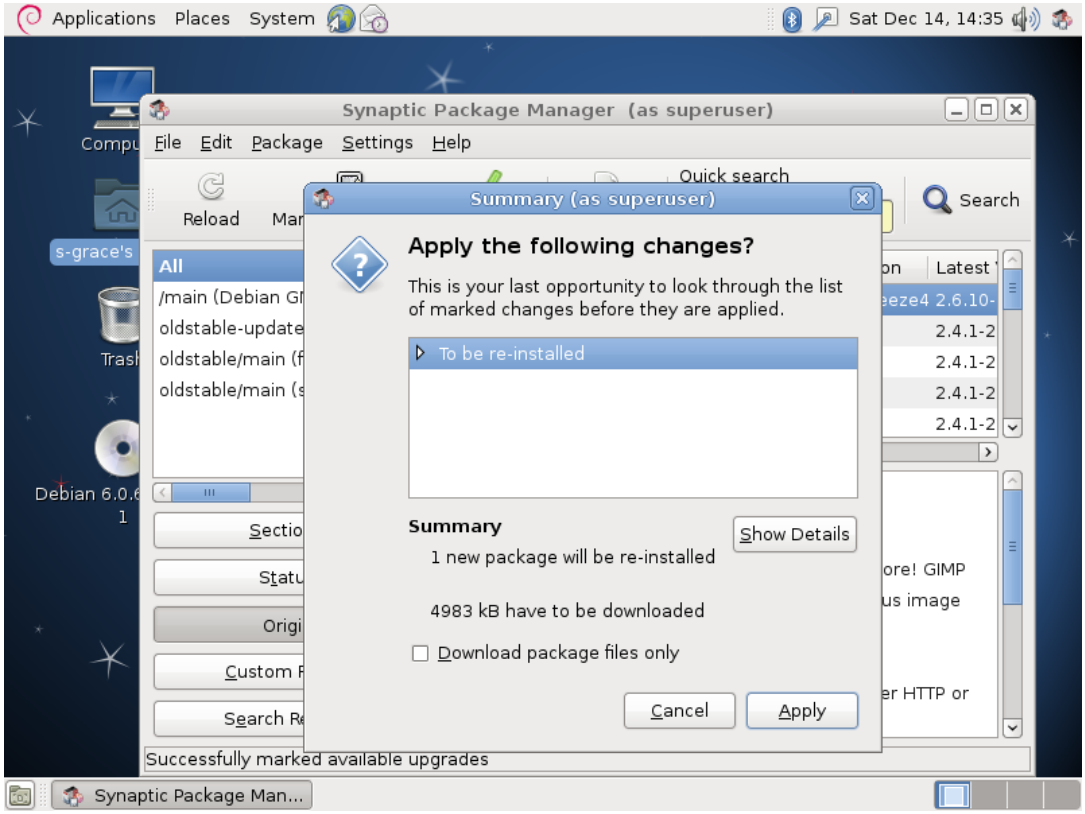
The gimp graphics package is a very good and widely used package. A version of gimp is pre-installed with our debian installation, therefore we will use this opportunity to illustrate how to ensure that the most up to date version of an open source program is running.



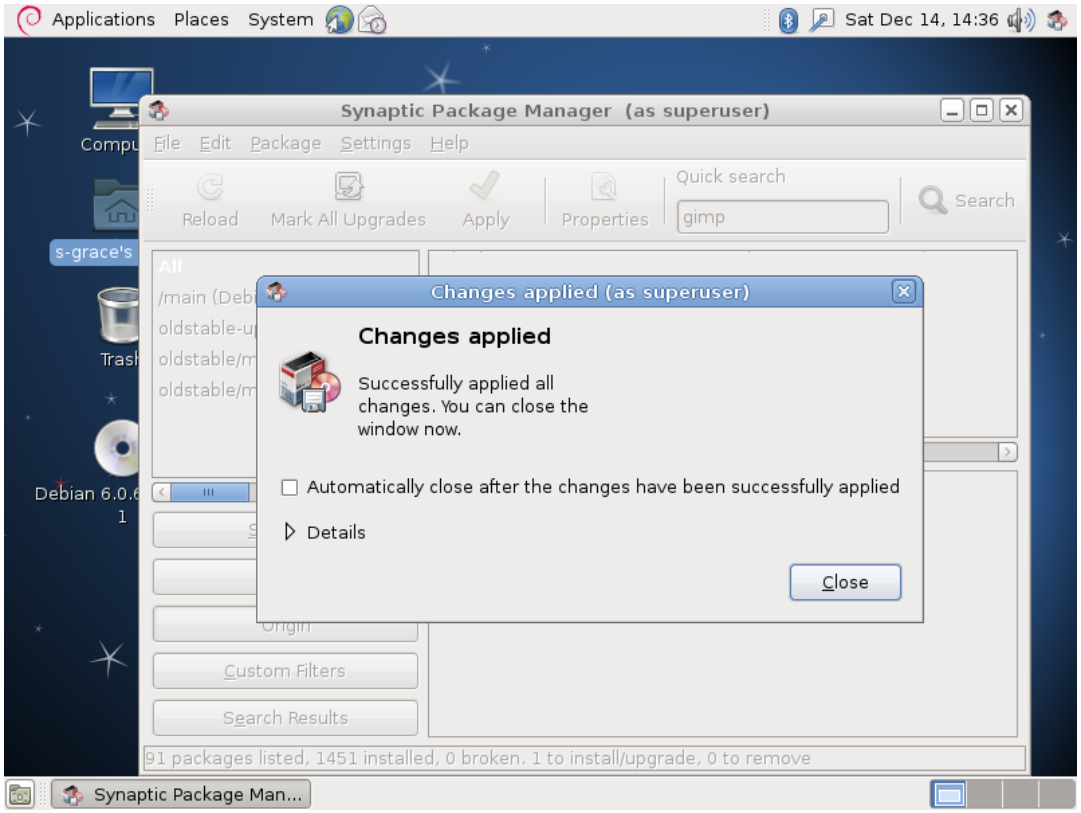

From the desktop we click on "system" followed by "administration" and then by "synaptic package manager". When this application has opened we enter "gimp" into the search bar and click the "search" button.




We right click on the gimp package and select "mark for reinstallation"




We then click on "apply" and gimp is then updated to the most up to date version.



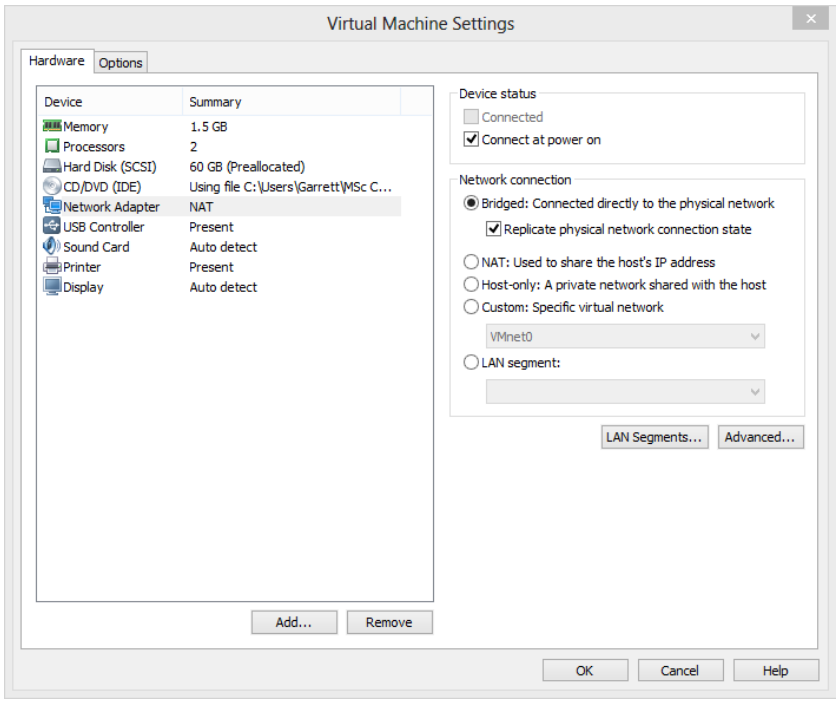

We receive confirmation that the changes have been successfully applied, and we click on "close".

## Section C - Networking

## Task C.1 - Network

### C.1.1 - Bridged Network Connection to Virtual Machines

We will statically assign unique IP addresses to each of our machines. In order to do so we must power off each virtual machine in VMWare Workstation, and then click on "edit virtual machine settings".




From the resultant window we click the radio button for "Bridged: Connected directly to the network", followed by "ok". After which we can power on the virtual machines again.

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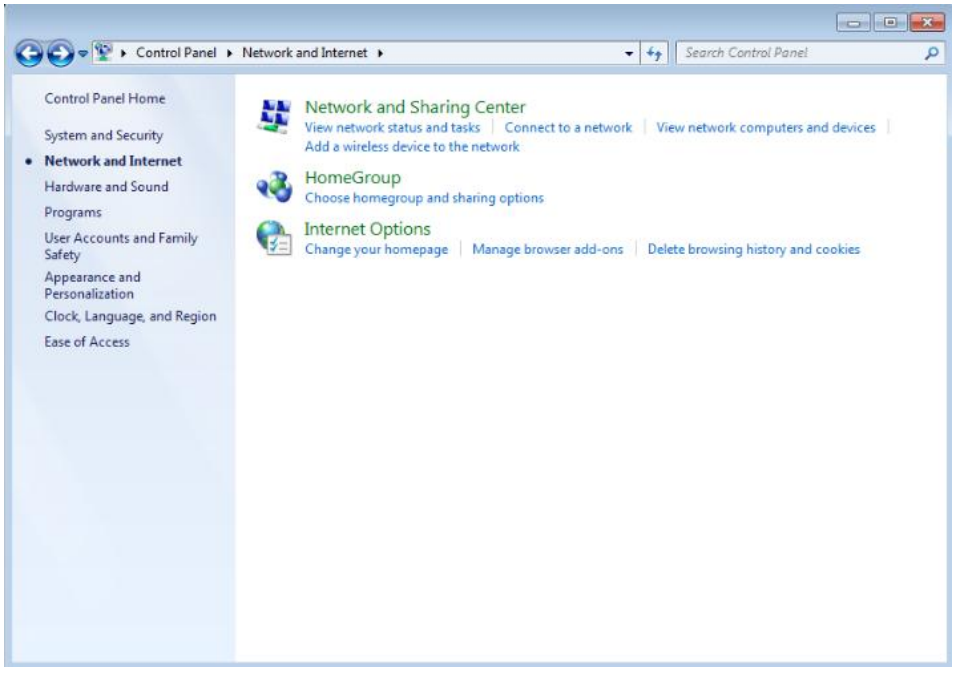
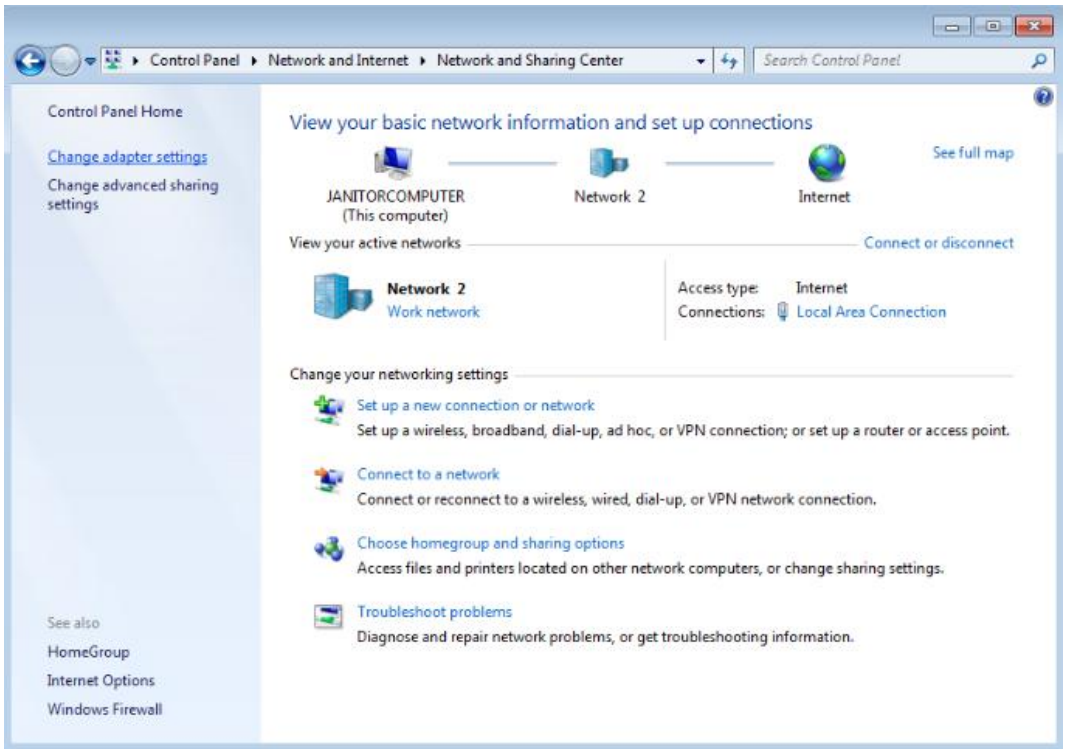
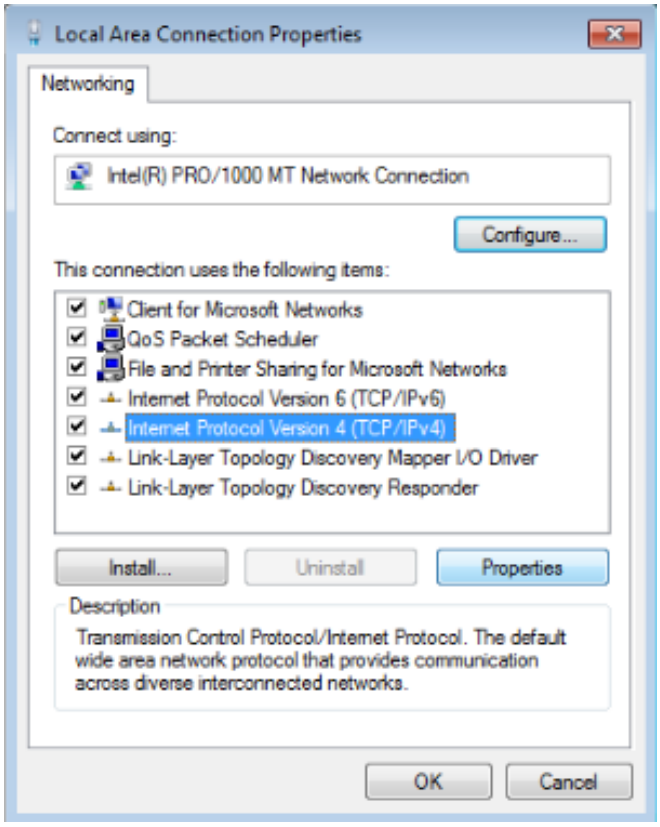
### C.1.2 - Assigning Static IP Address to Windows Machine



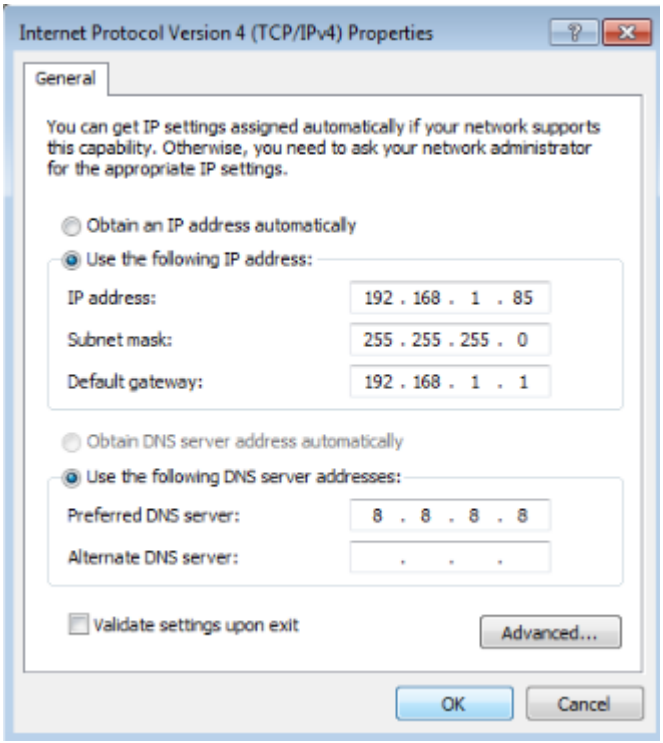

From the "start" menu we select "control panel" followed by "network and internet" followed by "network and sharing centre".


Control Panel ▸ Network and Internet ▸ Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings
View your basic network information and set up connections
See full map
JANITORCOMPUTER
(This computer)
Network 2
Internet
View your active networks
Connect or disconnect
Network 2
Work network
Access type: Internet
Connections: Local Area Connection
Change your networking settings
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.
Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.
Choose homegroup and sharing options
Access files and printers located on other network computers, or change sharing settings.
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.
See also
HomeGroup
Internet Options
Windows Firewall

In the network and sharing centre we select "change adapter settings", and in the resultant "network connections" dialog we right click on the "local area connection" icon and select "properties".




In the "Local Are Connection Properties" menu we click and highlight the IPv4 settings followed by "Properties".


Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 85
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 1 . 1
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server: 8 . 8 . 8 . 8
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

We then select the radio button to "Use the following IP address:"

We will use IP Address settings for a Class C Network e.g. A home network environment.

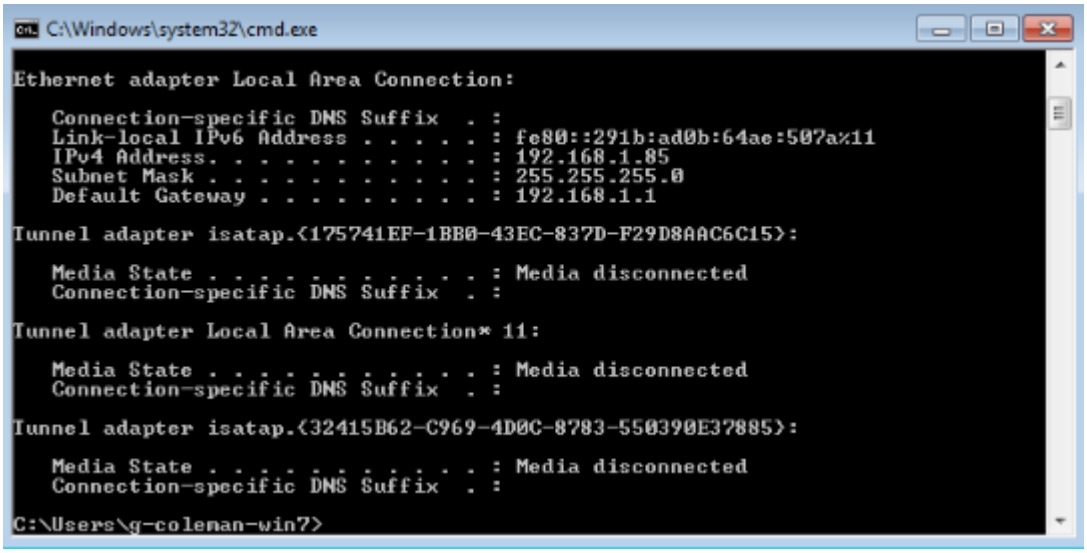
We then enter the IP address as 192.168.1.85.

We then enter the Subnet mask as 255.255.255.0.

We then enter the Default gateway as 192.168.1.1 (this is the default gateway for the router).

We then enter the "Preferred DNS server" enter as 8.8.8.8

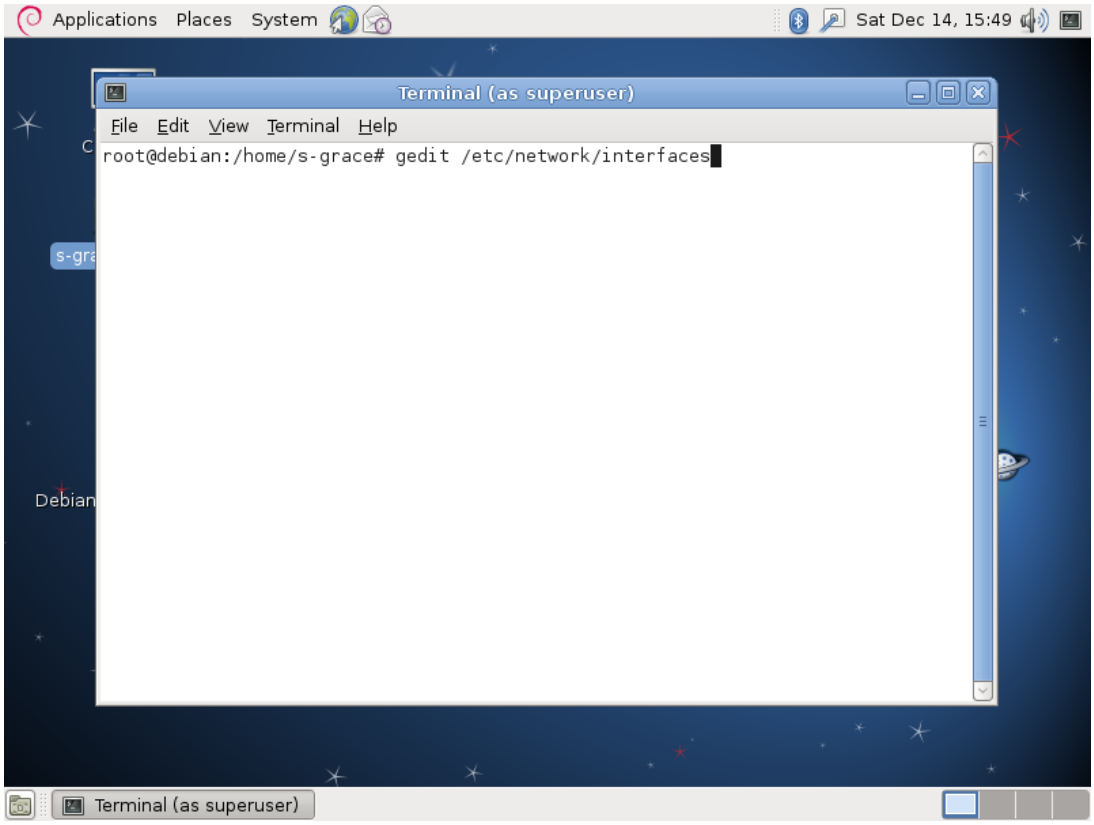
We then click "OK" to effect the changes we have made.


C:\Windows\system32\cmd.exe
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix . :
Link-local IPv6 Address . . . . . : fe80::291b:ad0b:64ae:507a%11
IPv4 Address. . . . . : 192.168.1.85
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.1.1
Tunnel adapter isatap.{175741EF-1BB0-43EC-837D-F29D8AAC6C15}:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Tunnel adapter Local Area Connection* 11:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Tunnel adapter isatap.{32415B62-C969-4D0C-8783-550390E37885}:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
C:\Users\g-colenan-win7>

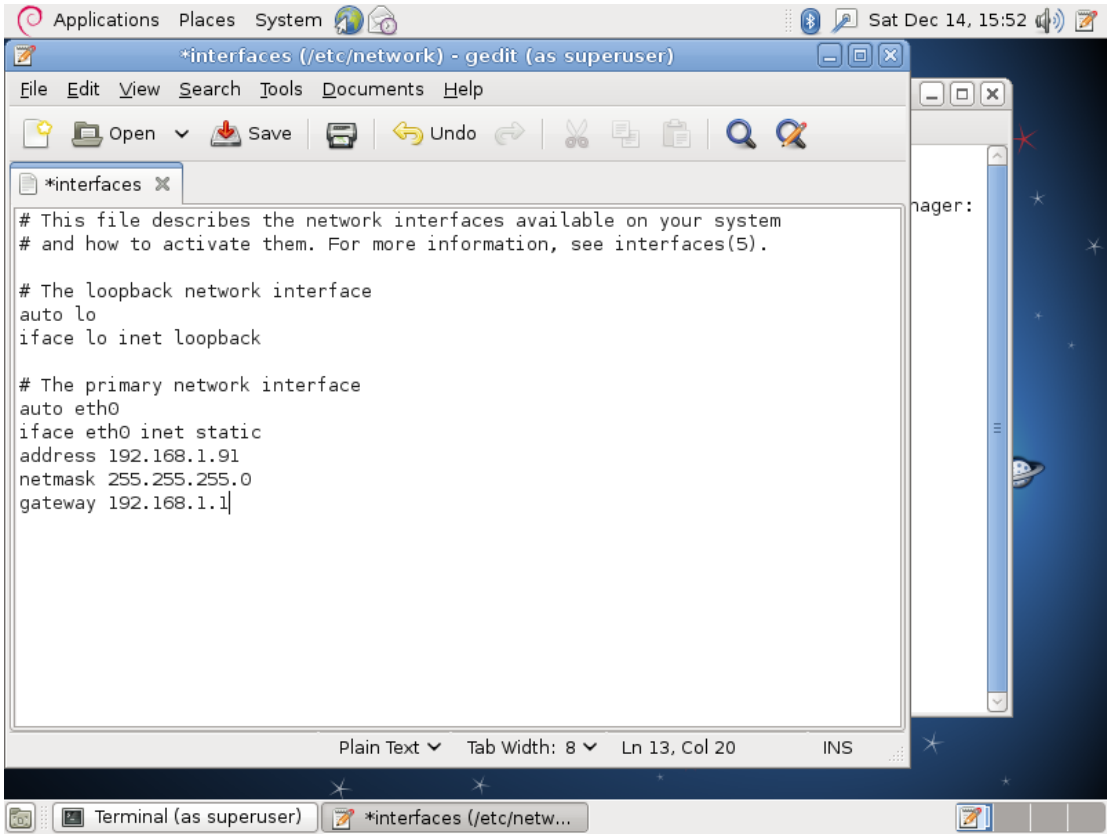
We next check that the IP address we have specified has been assigned, by entering the command prompt, by entering "cmd" into the search bar on the "start" menu, and opening the command prompt.

We now type "ipconfig" as a command, and we can see that our new IP address has been assigned to the machine.

### C.1.3 - Assigning Static IP Address to Debian Machine




On the debian desktop we click "applications" followed by "accessories" and then "root terminal". This opens the above window, where we type "gedit /etc/network/interfaces".


Applications Places System
Sat Dec 14, 15:52
*interfaces (/etc/network) - gedit (as superuser)
File Edit View Search Tools Documents Help
Open Save Undo
*interfaces
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).
# The loopback network interface
auto lo
iface lo inet loopback
# The primary network interface
auto eth0
iface eth0 inet static
address 192.168.1.91
netmask 255.255.255.0
gateway 192.168.1.1
Plain Text Tab Width: 8 Ln 13, Col 20 INS
Terminal (as superuser)
*interfaces (/etc/netw...

This opens the interface file where we can see the network information for the machine.

We click on "edit" to change the interfaces, as with the windows machine above, we will use a Class C network.

Below "The primary network interface" we type the following (be aware of case sensitivity and spacing:

auto eth0

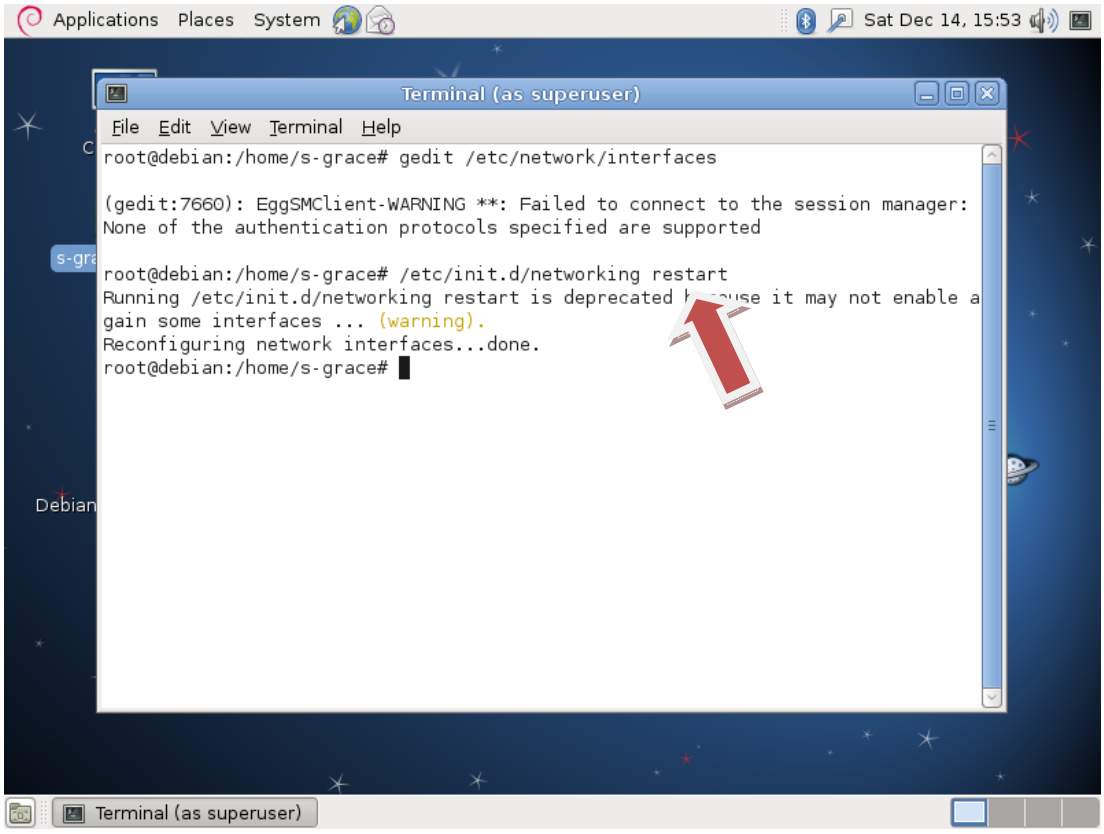
**iface eth0 inet static**

**address 192.168.1.91**

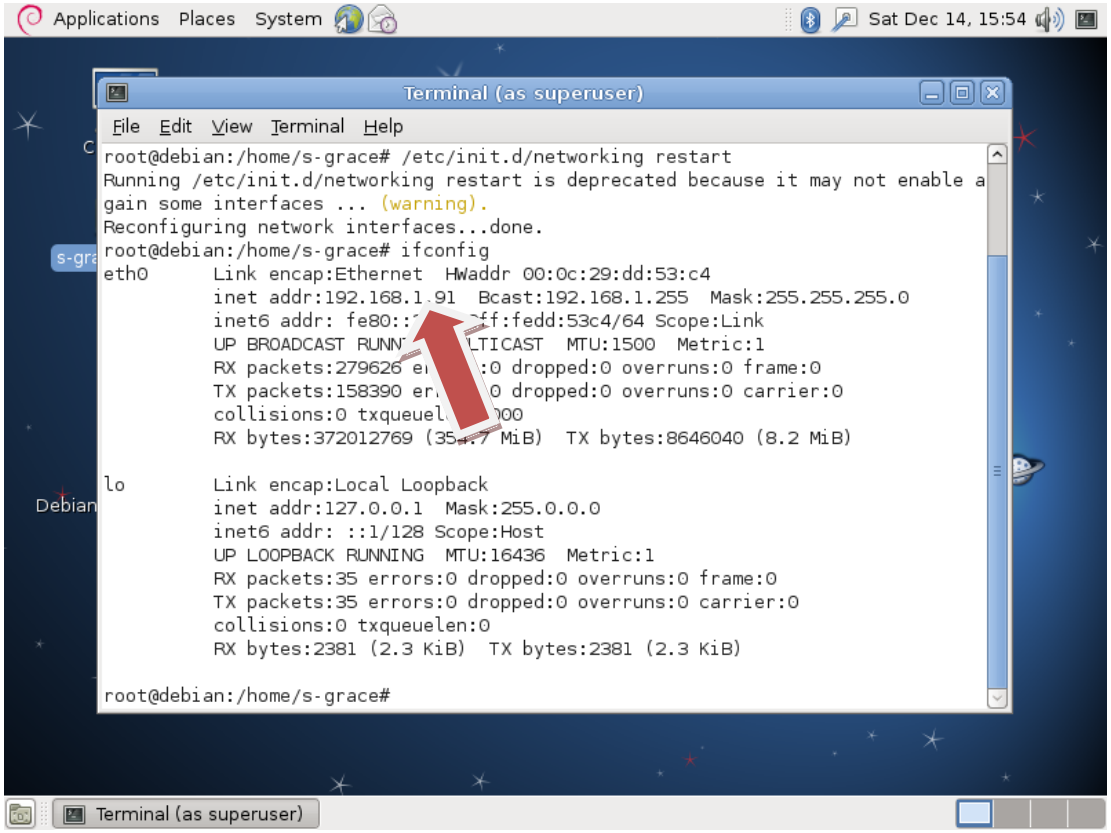
**netmask 255.255.255.0**

**gateway 192.168.1.1**

Once the above has been entered, we click "file" followed by "save"


Applications Places System
Sat Dec 14, 15:53
Terminal (as superuser)
File Edit View Terminal Help
root@debian:/home/s-grace# gedit /etc/network/interfaces
(gedit:7660): EggSMClient-WARNING **: Failed to connect to the session manager:
None of the authentication protocols specified are supported
root@debian:/home/s-grace# /etc/init.d/networking restart
Running /etc/init.d/networking restart is deprecated
gain some interfaces ... (warning).
Reconfiguring network interfaces...done.
root@debian:/home/s-grace#
Terminal (as superuser)

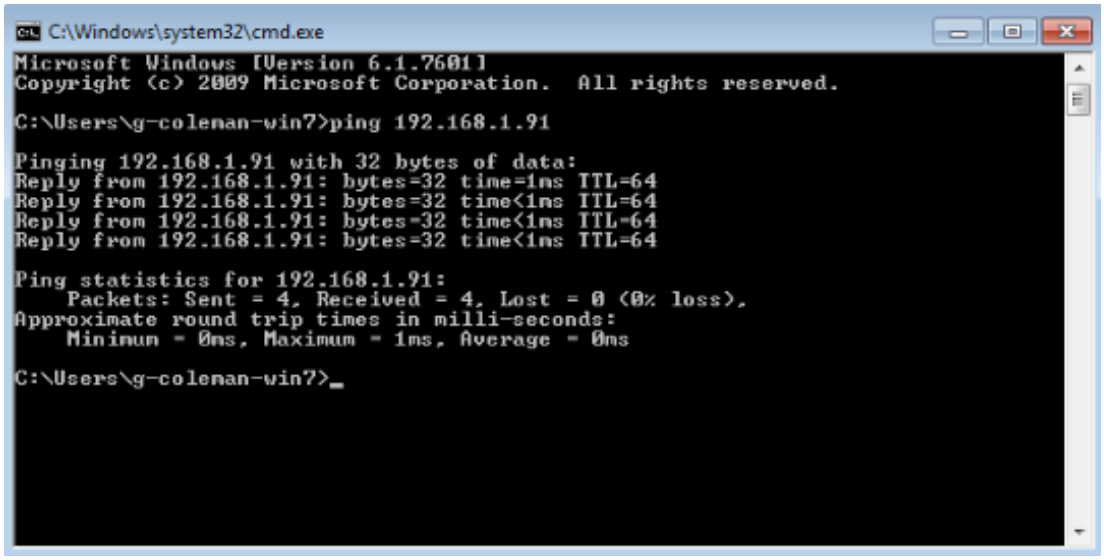
To effect the above changes it is necessary on a debian operating system to restart the network. This is done by returning to the root terminal and typing:
"/etc/int.d/networking restart".



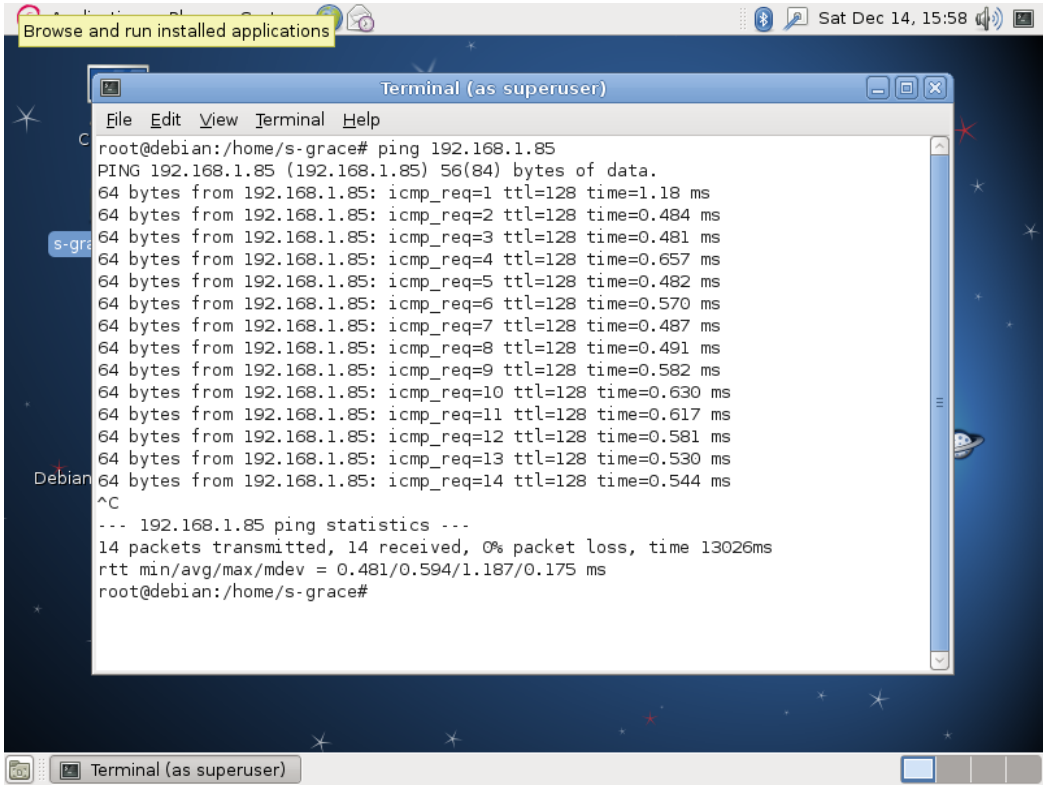

Once the network has restarted, from the root terminal we type "ifconfig", and we see that the new IP address has now been assigned to the machine.

### C.1.4 - Static Communication Between Machine 1 and Machine 2

We will use the ping command to communicate between the two machines.


C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\g-coleman-win7>ping 192.168.1.91
Pinging 192.168.1.91 with 32 bytes of data:
Reply from 192.168.1.91: bytes=32 time=1ms TTL=64
Reply from 192.168.1.91: bytes=32 time<1ms TTL=64
Reply from 192.168.1.91: bytes=32 time<1ms TTL=64
Reply from 192.168.1.91: bytes=32 time<1ms TTL=64
Ping statistics for 192.168.1.91:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\Users\g-coleman-win7>_

On the windows machine, we re-enter the command prompt and type "ping 192.168.1.91" (this is the IP address which we have assigned to the debian machine), and hit enter. The ping the sends packets of data to the IP address of the debian machine, and returns statistics that 4 packets were sent, with 4 received and none lost, ths confirming that the windows machine has successfully communicated with the debian machine.


Browse and run installed applications
Sat Dec 14, 15:58
Terminal (as superuser)
File Edit View Terminal Help
root@debian:/home/s-grace# ping 192.168.1.85
PING 192.168.1.85 (192.168.1.85) 56(84) bytes of data.
64 bytes from 192.168.1.85: icmp_req=1 ttl=128 time=1.18 ms
64 bytes from 192.168.1.85: icmp_req=2 ttl=128 time=0.484 ms
64 bytes from 192.168.1.85: icmp_req=3 ttl=128 time=0.481 ms
64 bytes from 192.168.1.85: icmp_req=4 ttl=128 time=0.657 ms
64 bytes from 192.168.1.85: icmp_req=5 ttl=128 time=0.482 ms
64 bytes from 192.168.1.85: icmp_req=6 ttl=128 time=0.570 ms
64 bytes from 192.168.1.85: icmp_req=7 ttl=128 time=0.487 ms
64 bytes from 192.168.1.85: icmp_req=8 ttl=128 time=0.491 ms
64 bytes from 192.168.1.85: icmp_req=9 ttl=128 time=0.582 ms
64 bytes from 192.168.1.85: icmp_req=10 ttl=128 time=0.630 ms
64 bytes from 192.168.1.85: icmp_req=11 ttl=128 time=0.617 ms
64 bytes from 192.168.1.85: icmp_req=12 ttl=128 time=0.581 ms
64 bytes from 192.168.1.85: icmp_req=13 ttl=128 time=0.530 ms
64 bytes from 192.168.1.85: icmp_req=14 ttl=128 time=0.544 ms
^C
--- 192.168.1.85 ping statistics ---
14 packets transmitted, 14 received, 0% packet loss, time 13026ms
rtt min/avg/max/mdev = 0.481/0.594/1.187/0.175 ms
root@debian:/home/s-grace#
Debian
Terminal (as superuser)

We repeat the process from the root terminal of the debian machine, typing "ping 192.168.1.85" (the IP address we have assigned to the windows machine). The ping utility on debian will continue to transmit packages until we stop it by pressing control + c, at which time we are given a summary to say that packages were transmitted and received, thus confirming that the debian machine has communicated with the windows machine.

## Appendix A - Assignment Details

**INSTITUTE OF PUBLIC ADMINISTRATION**
**MSc in Computer Science**
**Foundations in Hardware and Software**

**Module Assignment**

**Introduction**
The purpose of this assignment is to give you a thorough understanding of hardware and software by deepening your practical knowledge and skills in relation to both.

In this assignment, you will be asked to carry out a series of practical tasks.

Important: an essential part of this assignment will be to document the procedures by which you completed each task from beginning to end.

Each task should be described in a series of steps. In addition, for each task, you should provide two or three legible screen shots as evidence that you have actually worked through the task. (Screen shots are normally placed at the most important stages/steps in any task).

The documentation should be laid out to resemble a professional user's manual, aimed at the novice technician (someone who knows little of such procedures).

The documentation / manual should adopt the standards we associate with such documentation.

At the end of the assignment you will be required to produce the following deliverables:

- A user's manual documenting the steps you used to complete each task

In this assignment you will be asked to create two virtual machines. The specifications for both machines are given below in Sections A and B, respectively. On each of these machines you will be asked to carry out a number of practical tasks.

You are required to answer both Sections of the Assignment.

**Section A**

Machine 1

**Task A. 1**

Using either Virtual Box or Virtual PC create two virtual machines. The specification for machine 1 is given directly below

- Machine name: X –win7 (where X is your initial-surname)
- RAM: at least 1024MB
- Hard Disk 60GB Hard

On this virtual machine environment install Microsoft Windows 7 Entreprise as follows:
The system is to be set-up with two partitions, 50GB and 10GB in size

One partition is to be used for the installation of the operating system and files, and is to use a file system acessable by other operating systems for access to files and diagnostic purposes.

The second partition will be used for creation of secured directories for system users

Assign the machine to workgroup X (where X is your initial-surname)

**Task A.2**

Updates & Antivirus

The system should be updated with all service packs and security fixes.

An antivirus is to be installed with scheduled scans to be ran at least once a week.

Windows firewall is to be active

**Task A.3**

Users, Groups & Security

In accordance with best practice implement the security polices in relation to passwords, logons and set up the machine to enforce these requirements.

The following users are staff members who will require logon access to this machine. For each of the users, create accounts and groups, in accordance with best practice

| | | |
|---|---|---|
| Name: Samantha Grace | Department: | IS |
| Name: Rachael Mathews | Department: | IS |
| Name: Sam Smith | Department: | Finance |
| Name: Paul Daniels | Department: | Finance |

Name: Stephanie Brown Department: HR
Name: Francis Brennan Department: HR
[Note: The username follows the structure: firstinitial.surname
Samantha Grace is also to be given membership to an administrators group.]

Using the second partition, create a folder structure to meet the following requirements:
Each department should have its own folder with each user within the department having a private folder accordingly.

Share out each department folder and restrict same to only allow members of each department access to the folders – this access is to be restricted both from remote and local access.

Grant the administrators group full access to all of the folders.

In accordance with best practice and company policy block access to three common social media sites.

**Task A.4**
Remote connectivity

Set up remote desktop on the machine to enable administrators to carry out administrative tasks.

To increase security, the default port is to be changed, modify any system settings accordingly.

**Task A.5**
Performance

Use swap file to improve the performance of the machine.

Verify the improved performance by means of a benchmarking tool and clearly document the results.

**Task A.6**
Email accounts

An Email account is to be setup using an Email client for the user account Samantha Grace using the following details.

Mail server type IMAP

Email address s.grace@pretendacc.com

Incoming and outgoing mail server: mail1.pretendacc.com

**Task A.7**
System Restore setup and testing

A system restore point is to be created.

After creating the system restore point, perform the following:

Change the name of the machine to 'mc1'.

Create two new folders on the desktop called folder1 and folder2, add a text file into folder1 called notes, enter your name within this file.

Disable the floppy diskette within the machine

Restore the pc to the restore point created earlier. Outline what changes the system restore process has performed.

**Task A.8**
System registry

Create a backup of the registry and save it to a folder called backup on the second partition.

**Task A.9**
Driver compatibility

In order to maintain the stability of the operating system environment in the future it is required that you prevent any unsigned drivers from being installed.

**Section B**
Machine 2
This section deals with machine 2.

**Task B.1**
A customer is looking at implementing a webserver inhouse to share company documents on the network. They are looking for advice on the benefits and drawbacks to using both Windows and Linux as a hosting platform. Using the existing windows installation, as per Section A, install Microsoft's web-server.

Create a second virtual machine and on this new virtual machine install Apache web-server on Debian Linux.

**Task B.2**

Create users and user account structures with the same details as those in Section A

**Task B.3**

On machine 2 install open source products for
Email (Thunderbird)
A firewall
Anti Virus
Graphics and Image editing package

**Section C**

**Task C.1**

Network

Implement the procedures required so that machine 1 and machine 2 (outlined in section B) can communicate statically with one another. Outline the TCP/IP settings to be used on each of the machines and set this machine up accordingly

**IMPORTANT:**

At the end of the assignment do not forget to submit:
A user's manual documenting the steps you used to complete each task. The user's manual should be emailed to ckelly@ipa.ie on or by the deadline given.

Most Important: This assignment is to be completed individually. You are NOT permitted to consult with other members of your group. This regulation is being implemented on a code of honour basis. We ask you to respect it.

Failure to abide by it may result in disqualification.

The very best of good wishes and good luck to you.